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FINAL REPORT  
VOLUME II

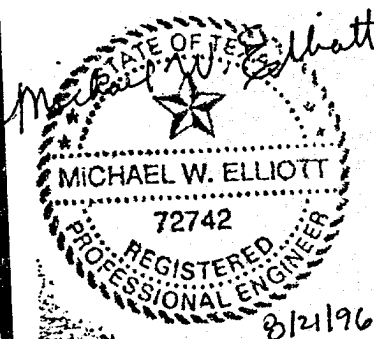
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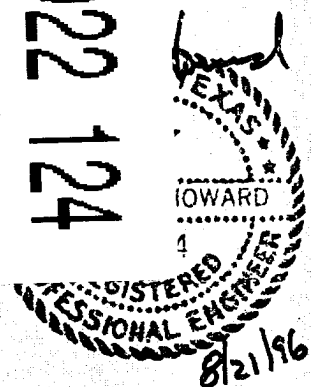
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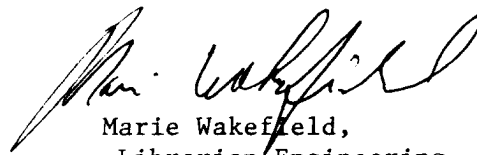


DEPARTMENT OF THE ARMY  
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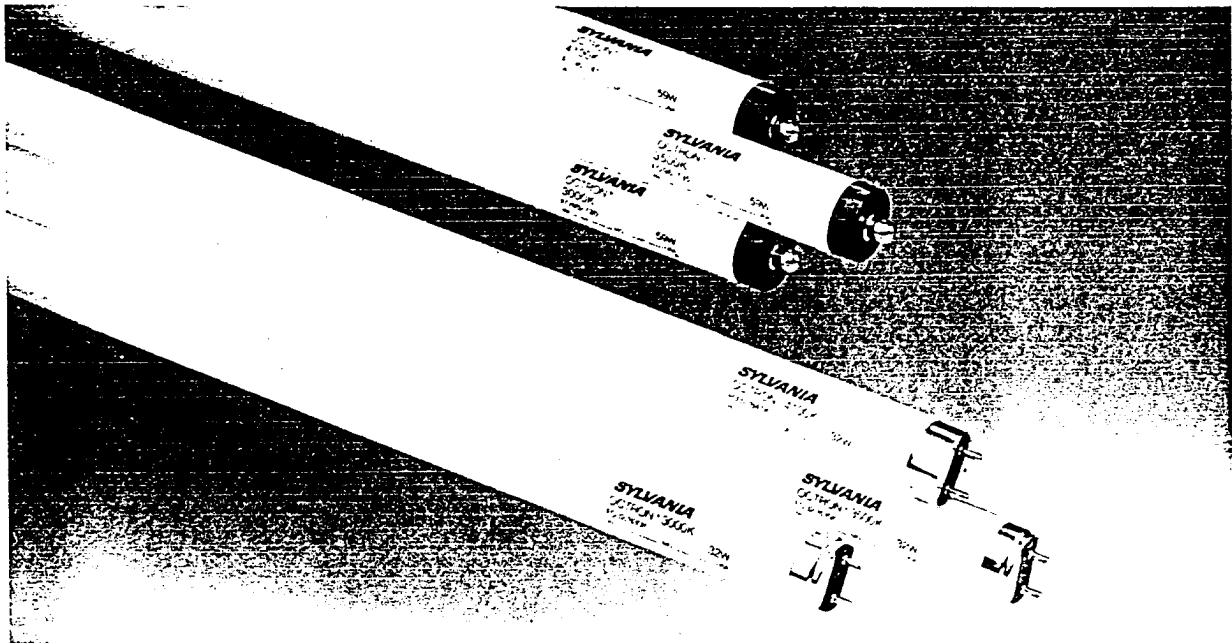
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# OCTRON<sup>®</sup>

## Fluorescent Lamps



### The Widest Range of T8 Lamps Available

Through its OCTRON<sup>®</sup> line OSRAM SYLVANIA offers more T8 lamp options than any other manufacturer. This gives architects, lighting designers, engineers, contractors and other specifiers the opportunity to select exactly the right mix of lamps to meet the precise requirements of an application.

All OCTRON lamps have a 20,000 hour average rated life when operated on rapid start ballasts. Lamps are rated at 15,000 hours when operated on instant start ballasts. (These figures are based on three hours of operation per start. Ratings will improve as burning cycles increase. In a typical 10 hour per day application, for example, life ratings on rapid start or instant start ballasts are increased by 35 percent.) Because long life means less frequent lamp replacement and smaller lamp inventories, maintenance costs can be substantially reduced.

### OCTRON<sup>®</sup> Bipin Linear Lamps

OCTRON bipin linear fluorescent lamps are available in four length/wattage combinations—2-foot (17W), 3-foot (25W), 4-foot (32W) and 5-foot (40W). This means there is an OCTRON T8 lamp to replace any commonly available bipin T12 lamp in any standard linear fluorescent fixture. OCTRON 700 Series lamps are available in four color temperatures—3000K, 3500K, 4100K and 5000K—and have a color rendering index of 75. The 800 Series lamps come in 3000K, 3500K and 4100K colors and have an exceptional CRI of 85.

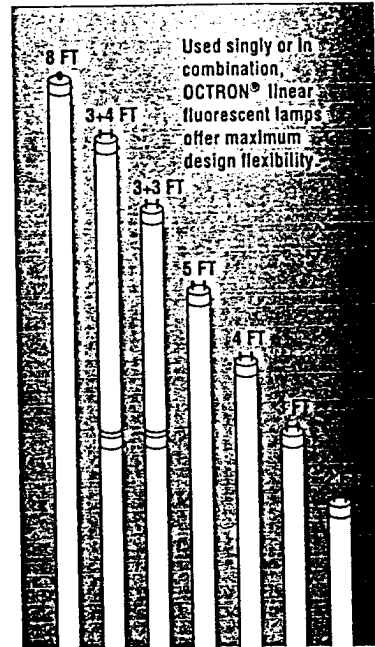
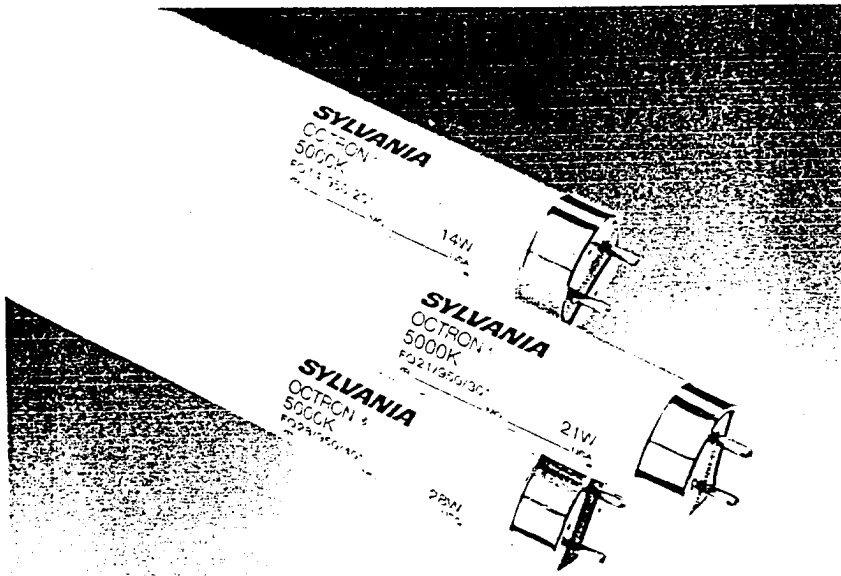
### OCTRON<sup>®</sup> Single Pin Lamps

The OCTRON family includes an 8-foot single pin T8 lamp. When used in combination with an electronic ballast OCTRON FO96T8 lamps can replace F96T12 systems—saving over 90 watts per two-lamp fixture. The 15,000 hour average rated life of this innovative lamp is 25 percent longer than ordinary F96T12 lamps. In addition, the argon fill gas in OCTRON FO96T8 lamps is less temperature sensitive than the krypton gas commonly used in F96T12/SS lamps. This improves light output in applications where cold air circulates. Available in 700 Series (75 CRI) and 800 Series (85 CRI) versions with a choice of 3000K, 3500K and 4100K colors.

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# T8 Linear Fluorescent Lamps



OCTRON 900 Series lamps are the only T8 lamps available that are suitable for color critical applications.

## OCTRON® 900 Series Lamps

The OCTRON® 900 Series offers the industry's only full color spectrum T8 fluorescent lamps. These high performance lamps are designed for a wide variety of color critical applications. Their CRI of 90 is the highest of any fluorescent lamp and they feature a color temperature of 5000K. The American National Standards Institute has specified 5000K light sources for color evaluation

and comparisons. 5000K was chosen because it is the average color of daylight—an almost universal light source. OCTRON 900 Series lamps have a wide range of uses in graphic arts, textile and quality control applications where accurate color evaluation and comparisons are essential. They are also ideal for backlighting displays and translucent signs. OCTRON 900 Series lamps are available in the standard 2-foot, 3-foot, 4-foot and 5-foot lamp lengths as well as special 20-inch, 30-inch and 40-inch versions. Wattages range from 14 to 40 watts. For increased flexibility, different sizes of OCTRON 900 Series lamps may be operated on a single multi-lamp instant start electronic ballast with uniform lamp life.

## Understanding OCTRON® T8 Technology

OCTRON T8 lamps can be operated effectively on rapid start magnetic and rapid start electronic ballasts. However, specific elements of OCTRON T8 technology are designed to achieve maximum performance on high frequency, instant start electronic ballasts.

The primary benefit of running OCTRON T8 lamps on electronic ballasts is the ability to use less energy to produce a given amount of light. The energy savings come from the fact that an electronic ballast drives OCTRON T8 lamps at high frequency—20,000 Hz—compared to 60 Hz for

a standard magnetic ballast. The increased frequency improves light output by up to 12 percent, allowing OCTRON lamps to provide dramatic energy cost savings while producing the same output as fluorescent T12 lamps. For even more savings, OCTRON fluorescent lamps may be operated with as little as 140 millamps of current on instant start electronic ballasts.

# OCTRON®

## OCTRON® CURVALUME®

### T8 Fluorescent Lamps

#### OCTRON® 700 Series Linear T8 Fluorescent Lamps

Watts	Bulb	Nominal Length (in.)	Base	Item Number	Ordering Abbreviation	Average Rated Life (hours)	Initial Lumens	Color Temp.	CRI
17	T-8	24	Medium Bipin	21849	F017/730	20000	1325	3000K	75
17	T-8	24	Medium Bipin	21832	F017/735	20000	1325	3000K	75
17	T-8	24	Medium Bipin	21831	F017/741	20000	1325	4100K	75
25	T-8	36	Medium Bipin	21851	F025/730	20000	2125	3000K	75
25	T-8	36	Medium Bipin	21817	F025/735	20000	2125	3500K	75
25	T-8	36	Medium Bipin	21829	F025/741	20000	2125	4100K	75
32	T-8	48	Medium Bipin	21852	F032/730	20000	2850	3000K	75
32	T-8	48	Medium Bipin	21823	F032/735	20000	2850	3500K	75
32	T-8	48	Medium Bipin	21824	F032/741	20000	2850	4100K	75
32	T-8	48	Medium Bipin	21809	F032/750	20000	2650	5000K	75
40	T-8	60	Medium Bipin	21853	F040/730	20000	3600	3000K	75
40	T-8	60	Medium Bipin	21820	F040/735	20000	3600	3500K	75
40	T-8	60	Medium Bipin	21827	F040/741	20000	3600	4100K	75
59	T-8	96	Single Pin	21854	F096/730	15000	5700	3000K	75
59	T-8	96	Single Pin	21839	F096/735	15000	5700	3500K	75
59	T-8	96	Single Pin	21840	F096/741	15000	5700	4100K	75

#### OCTRON® 800 Series Linear T8 Fluorescent Lamps

Watts	Bulb	Nominal Length (in.)	Base	Item Number	Ordering Abbreviation	Average Rated Life (hours)	Initial Lumens	Color Temp.	CRI
17	T-8	24	Medium Bipin	21903	F017/830	20000	1400	3000K	85
17	T-8	24	Medium Bipin	21904	F017/835	20000	1400	3500K	85
17	T-8	24	Medium Bipin	21905	F017/841	20000	1400	4100K	85
25	T-8	36	Medium Bipin	21913	F025/830	20000	2225	3000K	85
25	T-8	36	Medium Bipin	21914	F025/835	20000	2225	3500K	85
25	T-8	36	Medium Bipin	21915	F025/841	20000	2225	4100K	85
32	T-8	48	Medium Bipin	21923	F032/830	20000	3000	3000K	85
32	T-8	48	Medium Bipin	21924	F032/835	20000	3000	3500K	85
32	T-8	48	Medium Bipin	21925	F032/841	20000	3000	4100K	85
36	T-8	48	Medium Bipin	21930	F036/830	20000	3450	3000K	85
36	T-8	48	Medium Bipin	21931	F036/835	20000	3450	3500K	85
36	T-8	48	Medium Bipin	21932	F036/841	20000	3450	4100K	85
40	T-8	60	Medium Bipin	21938	F040/830	20000	3775	3000K	85
40	T-8	60	Medium Bipin	21939	F040/835	20000	3775	3500K	85
40	T-8	60	Medium Bipin	21940	F040/841	20000	3775	4100K	85
59	T-8	96	Single Pin	21897	F096/830	15000	6000	3000K	85
59	T-8	96	Single Pin	21898	F096/835	15000	6000	3500K	85
59	T-8	96	Single Pin	21899	F096/841	15000	6000	4100K	85

#### OCTRON® 900 Series Linear T8 Fluorescent Lamps

Watts	Bulb	Nominal Length (in.)	Base	Item Number	Ordering Abbreviation	Average Rated Life (hours)	Initial Lumens	Color Temp.	CRI
14	T-8	20	Medium Bipin	21868	F014/950/20	20000	750	5000K	90
17	T-8	24	Medium Bipin	21871	F017/950/24	20000	800	5000K	90
21	T-8	30	Medium Bipin	21869	F021/950/30	20000	1000	5000K	90
25	T-8	36	Medium Bipin	21872	F025/950/36	20000	1250	5000K	90
29	T-8	40	Medium Bipin	21870	F029/950/40	20000	1400	5000K	90
32	T-8	48	Medium Bipin	21880	F032/950/48	20000	1675	5000K	90
40	T-8	60	Medium Bipin	21873	F040/950/60	20000	2200	5000K	90

# Ordering Information

## OCTRON® CURVALUME® 700 Series T8 Fluorescent Lamps

Watts	Bulb	Nominal Length (in.)	Base	Item Number	Ordering Abbreviation	Average Rated Life (hours)	Initial Lumens	Color Temp.	CRI
16	T-8	10.5	Medium Bipin	21792	F8016/730	20000	1225	3000K	75
16	T-8	10.5	Medium Bipin	21800	F8016/735	20000	1225	3500K	75
16	T-8	10.5	Medium Bipin	21802	F8016/741	20000	1225	4100K	75
24	T-8	16.5	Medium Bipin	21794	F8024/730	20000	2025	3000K	75
24	T-8	16.5	Medium Bipin	21810	F8024/735	20000	2025	3500K	75
24	T-8	16.5	Medium Bipin	21804	F8024/741	20000	2025	4100K	75
31	T-8	22.5	Medium Bipin	21796	F8031/730	20000	2750	3000K	75
31	T-8	22.5	Medium Bipin	21807	F8031/735	20000	2750	3500K	75
31	T-8	22.5	Medium Bipin	21806	F8031/741	20000	2750	4100K	75
31	T-8	22.5	Medium Bipin	21819	F8031/750	20000	2550	5000K	75
32	T-8	22.5	Medium Bipin	21967	F8032/730/6	20000	2850	3000K	75
32	T-8	22.5	Medium Bipin	21968	F8032/735/6	20000	2850	3000K	75
32	T-8	22.5	Medium Bipin	21969	F8032/741/6	20000	2850	4100K	75

## OCTRON® CURVALUME® 800 Series T8 Fluorescent Lamps

Watts	Bulb	Nominal Length (in.)	Base	Item Number	Ordering Abbreviation	Average Rated Life (hours)	Initial Lumens	Color Temp.	CRI
16	T-8	10.5	Medium Bipin	21834	F8016/830	20000	1300	3000K	85
16	T-8	10.5	Medium Bipin	21835	F8016/835	20000	1300	3500K	85
16	T-8	10.5	Medium Bipin	21836	F8016/841	20000	1300	4100K	85
24	T-8	16.5	Medium Bipin	21874	F8024/830	20000	2125	3000K	85
24	T-8	16.5	Medium Bipin	21875	F8024/835	20000	2125	3500K	85
24	T-8	16.5	Medium Bipin	21876	F8024/841	20000	2125	4100K	85
31	T-8	22.5	Medium Bipin	21877	F8031/830	20000	2900	3000K	85
31	T-8	22.5	Medium Bipin	21878	F8031/835	20000	2900	3500K	85
31	T-8	22.5	Medium Bipin	21879	F8031/841	20000	2900	4100K	85
32	T-8	22.5	Medium Bipin	21970	F8032/830/6	20000	3000	3000K	85
32	T-8	22.5	Medium Bipin	21971	F8032/835/6	20000	3000	3500K	85
32	T-8	22.5	Medium Bipin	21972	F8032/841/6	20000	3000	4100K	85

### Sample Specifications

#### OCTRON®

Lamps shall be SYLVANIA OCTRON® (FO17, FO25, FO32, FO36\*, FO40, FO96) having a T8 bulb and \_\_\_\_\_ (medium bipin, single pin\*\*) bases. Lamps shall have a correlated color temperature of \_\_\_\_\_ (3000K, 3500K, 4100K, 5000K) and a color rendering index of \_\_\_\_\_ (75, 85). They are to be operated on \_\_\_\_\_ (magnetic rapid start, electronic instant start, electronic rapid start) ballasts.

\*Available only in 800 Series

\*\*FO96 only

#### OCTRON® CURVALUME®

Lamps shall be SYLVANIA OCTRON® CURVALUME® (FBO16, FBO24, FBO31, FBO32\*) having a \_\_\_\_\_ (1½", 6") leg spacing and medium bipin bases. Lamps shall have a correlated color temperature of \_\_\_\_\_ (3000K, 3500K, 4100K, 5000K) and a color rendering index of \_\_\_\_\_ (75, 85). They are to be operated on \_\_\_\_\_ (magnetic rapid start, electronic instant start, electronic rapid start) ballasts.

\*FBO32 is the only CURVALUME lamp with 6" leg spacing

#### OCTRON® 900 Series

Lamps shall be SYLVANIA OCTRON 900 Series fluorescent lamps having medium bipin bases. Lamps shall have a correlated color temperature of 5000K and a color rendering index of 90. Lamp lengths shall be \_\_\_\_\_ (20", 24", 30", 36", 40", 48", 60"). Lamps shall be operated on \_\_\_\_\_ (magnetic rapid start, electronic instant start, electronic rapid start) ballasts.

## For Orders And General Information

OSRAM SYLVANIA National Customer Support Center, 18725 N. Union Street, Westfield, IN 46074

Industrial/Commercial Phone: 800/255-5042

Fax: 800/255-5043

Consumer Products Phone: 800/842-7010

Fax: 800/842-7011

Specialty Lamps Markets Phone: 800/762-7191

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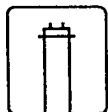
Phone: 800/562-4671

Phone: 800/562-4672

Fax: 800/562-4674

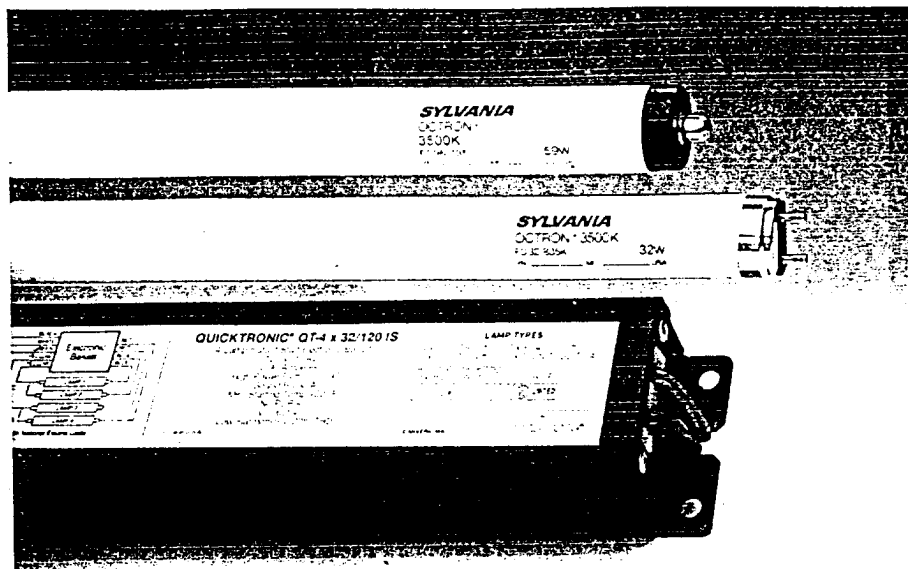
# Electronic Lighting Systems

## The System Solution



### A Complete Range of Fluorescent Systems

OSRAM SYLVANIA offers a QUICKTRONIC® system to provide optimum performance with every OCTRON® and OCTRON® CURVALUME® T8 lamp. There are also QUICKTRONIC systems for DULUX® L and F96T12 lamps. All QUICKTRONIC systems have a high ballast factor and high frequency circuitry for maximum light output and efficiency with minimal lamp flicker. Multi-lamp ballasts power up to four lamps with parallel circuitry that keeps remaining lamps lit when one or more fails. QUICKTRONIC systems are ideal for either retrofit or new installations.



### QUICKTRONIC® SYSTEM 32

QUICKTRONIC SYSTEM 32 is designed to use OCTRON 32W T8 fluorescent lamps and provides illumination equal to an F40T12 system with 40 percent less energy usage. It can also operate 17W, 25W and 40W T8 lamps, OCTRON CURVALUME lamps and 40W T5 twin lamps. QUICKTRONIC SYSTEM 32 is available in 120V and 277V versions to drive one, two, three and four-lamp systems. OCTRON and OCTRON CURVALUME T8 lamps are available in 75, 85 and 90 CRI versions and provide energy savings, high luminous efficacy and excellent color rendition. The DULUX L 40W is a single ended twin tube lamp that provides nearly the same light output as a 4-foot linear lamp.

### QUICKTRONIC® SYSTEM 36

QUICKTRONIC SYSTEM 36 is designed to operate OCTRON 36W T8 lamps. It provides up to 30 percent more lumen output than a standard 32W T8 system. It also operates DULUX L 39W twin tube fluorescent lamps. QUICKTRONIC SYSTEM 36 is a two-lamp system available in 120V and 277V versions. OCTRON 36W T8 lamps are available in 3000K, 3500K and 4100K versions and have a CRI of 85. They provide exceptional luminous efficacy and energy efficiency. The DULUX L 39W single ended twin tube lamp provides nearly the same light output as a 4-foot linear lamp and has an efficacy of up to 81 lumens per watt.

### QUICKTRONIC® SYSTEM 59

QUICKTRONIC SYSTEM 59 is designed to operate OCTRON FO96T8 lamps. It provides illumination equal to F96T12 lamps with 40 percent less energy usage. Because it is smaller and lighter than the F96T12 magnetic ballast it replaces, installation is easier and more flexible. QUICKTRONIC SYSTEM 59 is a two-lamp system available in 120V and 277V versions. OCTRON FO96T8 lamps have a single pin base and are designed to replace F96T12 lamps. OCTRON FO96T8 lamps come in three color temperatures—3100K, 3500K and 4100K and are available in 75 CRI and 85 CRI versions.

# QUICKTRONIC® SYSTEMS

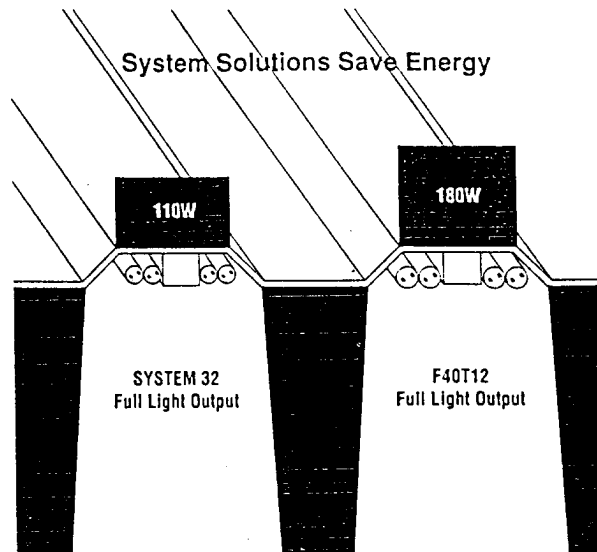
## QUICKTRONIC® SYSTEM 17

QUICKTRONIC® SYSTEM 17 is designed to operate OCTRON® 17W T8 and OCTRON® CURVALUME® 16W lamps with full energy efficiency, high lumen output and low harmonic distortion. QUICKTRONIC SYSTEM 17 is a three-lamp system available in 120V and 277V versions. OCTRON 17W T8 and OCTRON CURVALUME 16W lamps are available in both 75 and 85 CRI versions. When used in QUICKTRONIC SYSTEM 17 they provide energy savings, high luminous efficacy and excellent color rendering.

## QUICKTRONIC® SYSTEM 96

QUICKTRONIC SYSTEM 96 is designed to operate both standard and energy saving SYLVANIA F96T12 lamps and F96T12/HO lamps. It provides high lumen output, extremely efficient operation and up to 20 percent energy savings when compared to older magnetic ballasts. Other T12, SLIMLINE and H.O. lamps can also be driven. QUICKTRONIC SYSTEM 96 is a two-lamp system available in 120V and 277V versions. SYLVANIA F96T12 SLIMLINE and F96T12 High Output lamps are available in a range of colors with up to 80 CRI. Standard and energy saving versions are available.

### System Solutions Save Energy

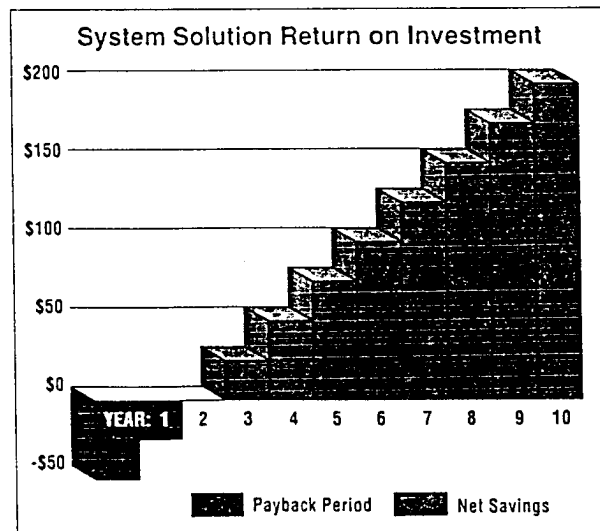


Power Input vs. Light Output for QUICKTRONIC® System 32 Compared to F40T12 System

## QUICKTRONIC® SYSTEM 55

QUICKTRONIC SYSTEM 55 is designed to operate DULUX® L 55W twin tube fluorescent lamps. It provides up to 50 percent more lumen output than standard T5 twin lamps with no loss in system efficiency. This is the ideal system for high lumen indirect, cove and 2x2 fixtures. QUICKTRONIC SYSTEM 55 is offered as a one or two-lamp system in 120V and 277V versions.

DULUX L 55W twin tube lamps provide up to 50 percent more light output than standard T5 twin lamps. DULUX L lamps offer an efficacy of up to 81 lumens per watt and are available in 3000K, 3500K and 4100K versions.



10 Year Payback on QUICKTRONIC® System 32 vs. F40T12 System

# OSRAM SYLVANIA

System Solutions

## Ordering Information

### QUICKTRONIC<sup>®</sup> Electronic Systems for Fluorescent Lamps

Item Number	Ordering Abbreviation	Voltage (VAC)	Lamp Type	No of Lamps	Input Wattage (W)	Ballast Factor	%THD
49256	QT1X32/120IS	120	32W-T8	1	31	.93	<20
49257	QT1X32/277IS	277	32W-T8	1	31	.93	<20
49270	QT2X32/120IS	120	32W-T8	2	62	.95	<20
49268	QT2X32/277IS	277	32W-T8	2	62	.95	<20
49258	QT3X32/120IS	120	32W-T8	3	88	.93	<20
49260	QT3X32/277IS	277	32W-T8	3	88	.93	<20
49265	QT4X32/120IS	120	32W-T8	4	110	.87	<20
49263	QT4X32/277IS	277	32W-T8	4	110	.87	<20
49262	QT2X36/120IS	120	36W-T8	2	78	1.05	<20
49267	QT2X36/277IS	277	36W-T8	2	78	1.05	<20
49340	QT2X59/120IS	120	59W-T8	2	105	.85	<20
49346	QT2X59/277IS	277	59W-T8	2	105	.85	<20
49252	QT3X17/120IS	120	17W-T8	3	50	.95	<20
49253	QT3X17/277IS	277	17W-T8	3	50	.95	<20
49250	QT2X96/120IS	120	F96T12	2	135	.88	<20
49254	QT2X96/277IS	277	F96T12	2	135	.88	<20
49255	QT2X96/120HO	120	F96T12/HO	2	210	.87	<20
49251	QT2X96/277HO	277	F96T12/HO	2	210	.87	<20
49287	QT2X55/120IS	120	55W Dulux L	2	110	1.00	<20
49288	QT2X55/277IS	277	55W Dulux L	2	110	.91	<20

### ACCUTRONIC<sup>™</sup> Low Voltage DC Electronic Systems for Compact Fluorescent Lamps

Item Number	Ordering Abbreviation	Voltage (VAC)	Lamp Type	No of Lamps	Input Wattage (W)	Ballast Factor	%THD
49401	AT7-9/12	12	7-9W Dulux SE & DE	1	10	1.00	
49400	AT7-9/24	24	7-9W Dulux SE & DE	1	10	1.00	

### POWERTRONIC<sup>™</sup> Electronic Systems for HID Lamps

Item Number	Ordering Abbreviation	Voltage (VAC)	Lamp Type	No of Lamps	Input Wattage (W)	Ballast Factor	%THD
49300	PT-DE 70/120	120	70W HQI-DE	1	80	1.00	<10
49301	PT-DE 70/277	277	70W HQI-DE	1	80	1.00	<10

### For Orders And General Information

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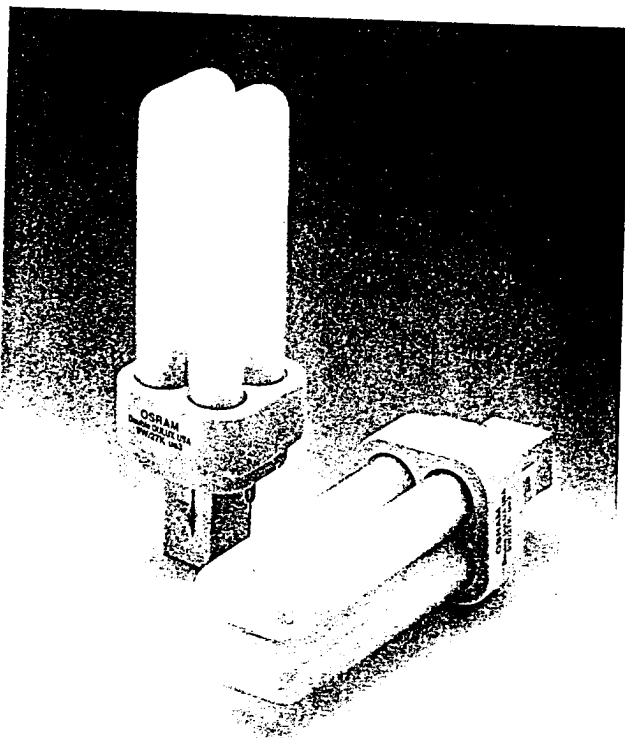
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# Product Information Bulletin

## DULUX® D Compact Fluorescent Lamps

**DULUX® D fluorescent lamps are more compact, use 75% less energy than incandescent lamps**

Available in a choice of 9, 13, 18 or 26 watts, these energy-saving lamps include sizes which operate on the same ballasts as DULUX S lamps



and higher wattage options for more light output.

More compact than DULUX S, the 9 and 13 watt DULUX D lamps are ideal for retrofit and other energy-saving fixtures where a small overall length is required. DULUX D 18 and 26 watt lamps are used in dedicated fixture designs where high light output and maximum energy efficiency are required.

The full family of DULUX D lamps, including 9, 13, 18, and 26 watt sizes, features a complete range of lumen packages up to 1800 lumens. They provide an even light distribution and serve as energy-saving replacements for incandescent lamps of up to 100 watts.

- Up to 75% less power consumption compared to incandescent lamps
- Long life of up to 10,000 hours for increased replacement intervals
- High luminous efficacy of up to 69 lumens per watt
- Trichrome phosphors for color rendition of up to 85 C.R.I.

■ Symmetrical luminous intensity.

■ A choice of 2700K warm color temperature, 3000K incandescent-like light, 3500K white light, and 4100K cool color temperature.

■ Plug-in base with integrated starter and interference suppressor

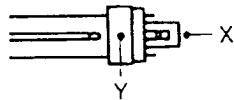
■ DULUX D lamps in the 18 and 26 watt sizes are designed for use in dedicated fixtures

■ Made in U.S.A.

### Applications:

Downlights, sconces, wall washers, task lights and pendant fixtures.

## Specifications and Ordering Information



Item Number	Ordering Abbreviation	Bulb Type	Base	Nominal Watts	Initial Lumens	Burning Position	Max. Base Temp. at Point X (F/C)	Max. Bulb Temp. at Point Y (F/C)
20689	CF90D/827	T-4	G23-2	9	575	Universal	194/90	302/150
20690	CF90D/835	T-4	G23-2	9	575	Universal	194/90	302/150
20691	CF130D/827	T-4	GX23-2	13	860	Universal	194/90	302/150
20705	CF130D/830	T-4	GX23-2	13	860	Universal	194/90	302/150
20692	CF130D/835	T-4	GX23-2	13	860	Universal	194/90	302/150
20708	CF130D/841	T-4	GX23-2	13	860	Universal	194/90	302/150
20676	CF180D/827	T-4	G24d-2	18	1250	Universal	194/90	312/150
20709	CF180D/830	T-4	G24d-2	18	1250	Universal	194/90	312/150
20677	CF180D/835	T-4	G24d-2	18	1250	Universal	194/90	312/150
20678	CF180D/841	T-4	G24d-3	18	1250	Universal	194/90	312/150
20679	CF260D/827	T-4	G24d-3	26	1800	Universal	194/90	302/150
20710	CF260D/830	T-4	G24d-3	26	1800	Universal	194/90	302/150
20680	CF260D/835	T-4	G24d-3	26	1800	Universal	194/90	302/150
20681	CF260D/841	T-4	G24d-3	26	1800	Universal	194/90	302/150

1. The G23-2 and GX23-2 bases are not compatible with some existing G23 and GX23 lamp products.

## Electrical and Photometric Specifications

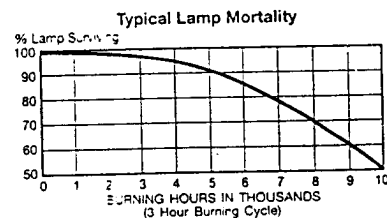
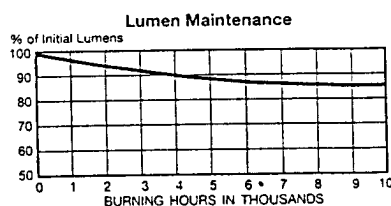
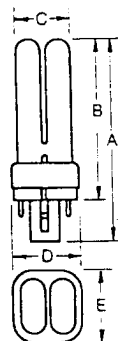
Ordering Abbreviation	Nominal Lamp Voltage (V)	Nominal Lamp Current (A)	Initial Lumens (lm)	Luminous Efficacy (lm/W)	Color Temp.	CRI	Average Rated Life (hrs.)*	Min. Starting Temp. (F/C)**
CF90D/827	59	.180	575	64	2700K	82	10000	25/-4
CF90D/835	59	.180	575	64	3500K	85	10000	25/-4
CF130D/827	59	.285	860	66	2700K	92	10000	32/0
CF130D/830	59	.285	860	66	3000K	85	10000	32/0
CF130D/835	59	.285	860	66	3500K	85	10000	32/0
CF130D/841	59	.285	860	66	4100K	85	10000	32/0
CF180D/827	100	.220	1250	69	2700K	82	10000	15/-9
CF180D/830	100	.220	1250	69	3000K	85	10000	15/-9
CF180D/835	100	.220	1250	69	3500K	85	10000	15/-9
CF180D/841	100	.220	1250	69	4100K	85	10000	15/-9
CF260D/827	105	.315	1800	69	2700K	82	10000	15/-9
CF260D/830	105	.315	1800	69	3000K	85	10000	15/-9
CF260D/835	105	.315	1800	69	3500K	85	10000	15/-9
CF260D/841	105	.315	1800	69	4100K	85	10000	15/-9

NOTE: Equipment manufacturers are advised to consult the relevant ANSI and EC standards for the maximum allowable dimensions and temperature to insure compatibility with similar products.

\*At 3 hours per start. \*\*At rated line voltage and correct lamp current.

## Dimensions and Performance Charts

Watts	A. Max. Overall Length [in (mm)]	B. Base Face to Top of Lamp [in (mm)]	C. Width of Lamp [in (mm)]	D. Maximum Base Width [in (mm)]	E. Maximum Base Length [in (mm)]
9	4.37 (111)	3.46 (88)	1.10 (28)	1.38 (35)	1.38 (35)
13	4.84 (123)	3.90 (99)	1.10 (28)	1.38 (35)	1.38 (35)
18	6.79 (172.5)	5.91 (150)	1.10 (28)	1.38 (35)	1.38 (35)
26	7.58 (192.5)	6.69 (170)	1.10 (28)	1.38 (35)	1.38 (35)



## For Orders and General Information

OSRAM SYLVANIA National Customer Support Center, 18725 N. Union Street, Westfield, IN 46074

Industrial/Commercial Phone: 800-255-5042  
Fax: 800-255-5043

Specialty Lamps/Markets Phone: 800-762-7191  
Fax: 800-762-7192

Consumer Products Phone: 800-842-7010  
Fax: 800-842-7011

National Accounts  
Industrial/Commercial Phone: 800-562-4671  
Consumer Products Phone: 800-562-4672  
Fax: 800-562-4674



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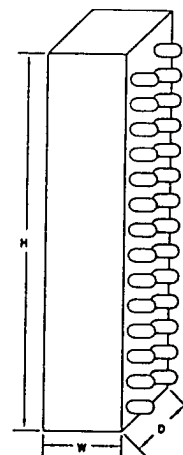
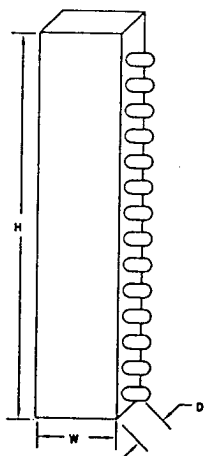
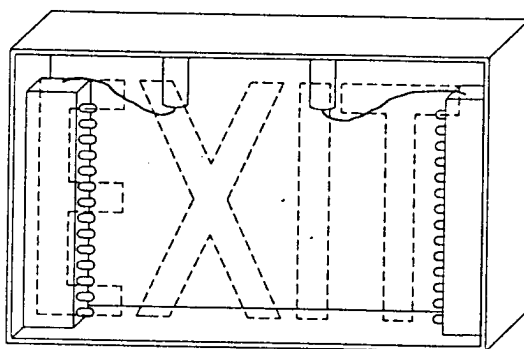
**OSRAM  
SYLVANIA**

Technology Brought to Light



# LED Exit Sign Retrofit Kits

- **1.8 - 3.6 Input Watts/Fixture. (Replaces standard 20-25 watt lamps.)**
- Convert existing incandescent EXIT signs to use energy efficient LED light strips.
- Each kit contains two LED light strips and a reflective backing to provide even light distribution and a new red lens for the fixture.
- Estimated life is 25 years.
- Complies with OSHA and NFPA requirements.
- Available in four base styles to fit existing sockets or as a hard wire kit.
- LED light strips emit a bright red light and are not recommended for use with green signs.
- In addition to DGSC standard warranty, manufacturer's 25 year warranty applies.
- UL approved.



TOTAL WATTS	BASE	VOLTS	NATIONAL STOCK NUMBER
-------------	------	-------	-----------------------

TOTAL WATTS	BASE	VOLTS	NATIONAL STOCK NUMBER
-------------	------	-------	-----------------------

SINGLE FACE KITS			
DIM: 6" H X 7/8" W X 3/4" D, each strip.			
1.8	DC BAY	120	6240-01-381-1658
1.8	INTERMEDIATE	120	6240-01-381-1702
1.8	CANDELABRA	120	6240-01-381-1843
1.8	MEDIUM	120	6240-01-381-1589
1.8	HARD WIRE	120	6240-01-381-1957
1.8	HARD WIRE	277	6240-01-381-2061

DOUBLE FACE KITS			
DIM: 6" H X 7/8" W X 1 1/2" D, each strip.			
3.6	DC BAY	120	6240-01-381-1594
3.6	INTERMEDIATE	120	6240-01-381-1633
3.6	CANDELABRA	120	6240-01-381-1695
3.6	MEDIUM	120	6240-01-381-1552
3.6	HARD WIRE	120	6240-01-381-1818
3.6	HARD WIRE	277	6240-01-381-1940

Information provided by Computer Power Inc. Astralite Division.

## APPLICATION – HALLWAYS

### Ultrasonic and PIR Sensors in Hallways

#### Application

Hallways, corridors, aisleways.

1. Check square footage and ceiling height of area.
2. Use coverage templates.
3. Do not use ultrasonic sensor if ceiling height exceeds 14 feet.
4. CI-100's are recommended for aisleways – do not use ultrasonics.
5. Make sure ultrasonic sensors are installed 6 to 8 feet away from air supply diffusers.
6. Point ultrasonic receiver openings down the hallway. Mount CI-100 with lens facing down the hallway.
7. Specify time-delay and sensitivity to match activity level of the space.

#### Savings

(See enclosed "Timer Test Study")

8 - 80 Watt 2' x 2' Troffers

- .64Kw x \$.10 per Kwh

- \$.064 cost per hour

Save 12 hours per day Mon-Fri

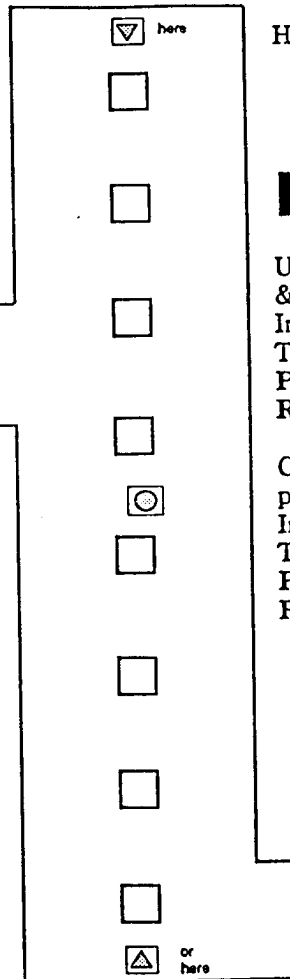
Save 33 hours per weekend

Total hours saved - 93 hours x 52 weeks

- 4836 hours per year

4,836 hour x \$.064 per hour

- \$309.50 ANNUAL SAVINGS



Hallway length - 80'

#### Payback/ROI

Ultrasonic sensor  
& power pack - \$125.00  
Installation - \$60.00  
Total Cost - \$185.00  
Payback - 7.2 Months  
ROI - 166%

CI-100 &  
power pack - \$100.00  
Installation - \$60.00  
Total Cost - \$160.00  
Payback - 6.2 Months  
ROI - 193%

- ☒ Ultrasonic Sensor
- ☐ CI-100 Passive Infrared Sensor

## APPLICATION – RESTROOMS

### Ultrasonic Sensors in Restrooms

#### Application

Large restrooms (with or without partitions).

1. Check square footage of area.
2. Use coverage templates.
2. Place sensor as close as possible to stalls. Ideally, over the top of stall entrance.
3. Make sure ultrasonic sensors are installed 6 to 8 feet away from air supply diffusers.
5. Specify time-delay and sensitivity to match activity level of the space.

#### Savings

(See enclosed "Timer Test Study")

8 - 80 Watt 2' x 4' Fluorescent fixtures

- .64Kw x .10 per Kwh

- \$.064 cost per hour

(Consider exhaust fan and ballast load)

Save 8 hours per day Mon-Fri

(Typically lights in bathrooms are on 16 to 24 hours a day.)

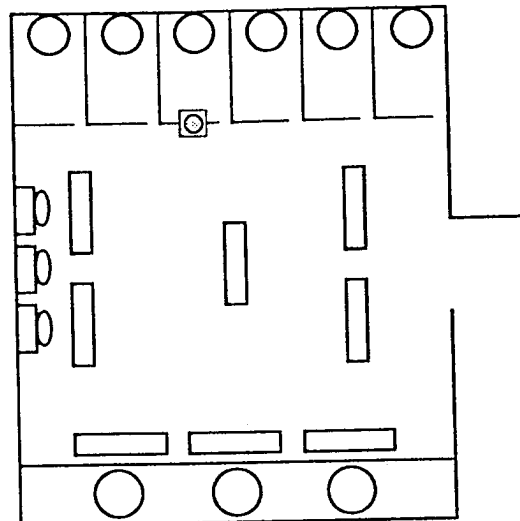
Save 27 hours per weekend

Total hours saved - 67 hours x 52 weeks

- 3,484 hours per year

3,484 hour x \$.064 per hour

- \$222.98 ANNUAL SAVINGS



Ultrasonic Sensor

#### Payback/ROI

Ultrasonic sensor & power pack - \$125.00

Installation - \$60.00

Total Cost - \$185.00

Payback - 9.9 Months

ROI - 121%

## APPLICATION – AREAS UNDER 300 SQ FT

### PIR Sensors and PIR Automatic Wall Switches in Building Areas of Under 300 Square Feet

#### Application

Offices, computer rooms, maintenance areas, vending areas, copy rooms, utility rooms.

1. Check square footage of area.
2. Use coverage templates.
3. Make sure PIR sensors have clear view of the controlled area.
4. Place sensor or "mask" lens so it does not "see" outside the room.
5. Specify time-delay and sensitivity to match activity level of the space.

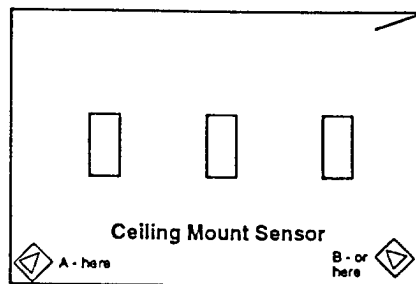
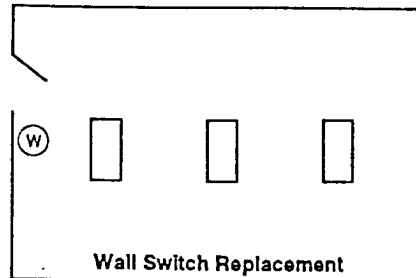
#### Savings

3 - 176 Watt 2' x 4' Troffers  
- .528Kw x \$.10 per Kwh  
- \$.053 cost per hour

Save 4 hours per day Mon-Fri  
Save 12 hours per weekend

Total hours saved - 32 hours x 52 weeks  
- 1,664 hours per year

1,664 hour x \$.053 per hour  
- \$88.19 ANNUAL SAVINGS



(W) WI or WS Series  
Automatic Wall Switch

(D) WPIR Sensor  
For enclosed office, use placement A or B.  
If the wall on the right does not exist, use placement B.

#### Payback/ROI

WI or WS Wall Switch - \$60.00  
Installation - \$20.00  
Total Cost - \$80.00  
Payback - 10.9 Months  
ROI - 110%

WPIR & power pack - \$80.00  
Installation - \$60.00  
Total Cost - \$140.00  
Payback - 19 Months  
ROI - 63%

## APPLICATION – COMMON AREA

### Ultrasonic, PIR, and Dual Technology Sensors in Common Building Areas Larger Than 300 sq ft

#### Application

Conference rooms, computer rooms, maintenance areas, classrooms, vending areas, lunch rooms, copy rooms

1. Check square footage of area.
2. Use coverage templates.
3. Make sure PIR sensors have clear view of the controlled area.
4. Place sensor or "mask" lens so it does not "see" outside the room.
5. Specify time-delay and sensitivity to match activity level of the space.

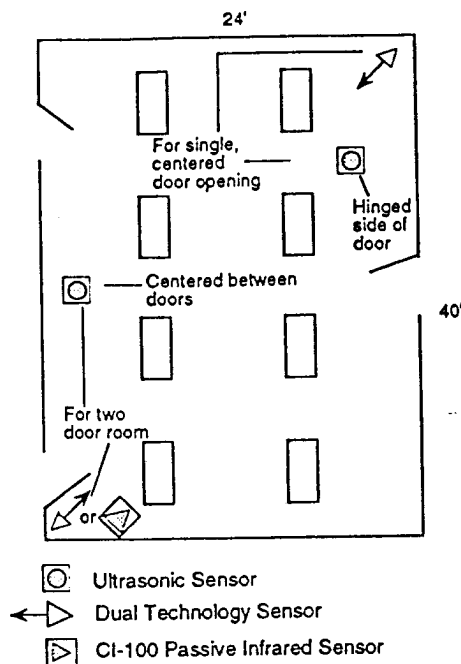
#### Savings

8 - 176 Watt 2' x 4' Troffers  
 - 1.41Kw x \$.10 per Kwh  
 - \$.141 cost per hour

Save 4 hours per day Mon-Fri  
 Save 12 hours per weekend

Total hours saved - 32 hours x 52 weeks  
 - 1,664 hours per year

1,664 hour x \$.141 cost per hour  
 - \$234.62 ANNUAL SAVINGS



#### Payback/ROI

Ultrasonic sensor & power pack - \$125.00  
 Installation - \$60.00  
 Total Cost - \$185.00  
 Payback - 9.5 Months  
 ROI - 127%

DT-100L & power pack - \$160.00  
 Installation - \$60.00  
 Total Cost - \$220.00  
 Payback - 11.3 Months  
 ROI - 107%

CI-100 & power pack - \$100.00  
 Installation - \$60.00  
 Total Cost - \$160.00  
 Payback - 8.2 Months  
 ROI - 147%

## APPLICATION – OPEN OFFICE AREA

### Ultrasonic, PIR, and Dual Technology Sensors in Open Office Area & Partitioned Offices

#### Application

1. Check square footage of area.
2. Use coverage templates.
3. Designing for smaller zones results in greater energy savings.
4. Make sure PIR sensors have clear view of the controlled area.
5. Specify time-delay to match activity level of the space.

#### Savings

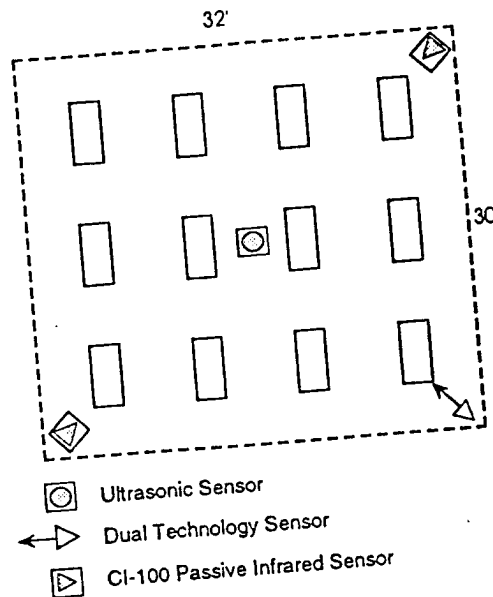
(See enclosed "Timer Test Study")

For an open office area with  
12 - 3 lamp fixtures - 1.44 Kw  
x \$.10 per Kwh - \$.144 cost per hour

Save 4 hours per day Mon-Fri  
Save 6.5 hours per weekend

Total hours saved - 26.5 hours x 52 weeks  
- 1,378 hours per year

1,378 hour x \$.144 cost per hour  
- \$198.43 ANNUAL SAVINGS



#### Payback/ROI

Ultrasonic sensor & power pack - \$125.00  
Installation - \$60.00  
Total Cost - \$185.00  
Payback - 11.2 Months  
ROI - 107%

DT-100L & power pack - \$160.00  
Installation - \$60.00  
Total Cost - \$220.00  
Payback - 13.3 Months  
ROI - 90%

2 - CI-100 sensors & power pack - \$180.00  
Installation - \$90.00  
Total Cost - \$270.00  
Payback - 16.3 Months  
ROI - 74%

\*\*Sensor, power pack, and installation costs are approximate.



## Applications

The Watt Stopper manufactures the most complete line of automatic lighting controls. A combination of Ultrasonic, Passive Infrared and Dual Technology sensors can be used to configure any application. For specific information on how the technologies work see "Passive Infrared Sensor Technology", "Ultrasonic Technology", and "Dual Technology" sections under 'technical data'. Some of the most common uses are described here.

### Office Buildings

The Watt Stopper occupancy sensors are the perfect product to control lighting in the office environment. With all three technologies, effective energy savings can be achieved in every space. Our recommendations are:

• OFFICES - WPIR, WI or WS series wall switches	15-70%	Savings
• OPEN OFFICE SPACES - CI-100, CI-200, W,1000A W2000A, DT-100L	5-25%	Savings
• CONFERENCE ROOMS - W500A, W1000A, DT-100L, CI-100	20-65%	Savings
• COMPUTER ROOMS - DT-100L, WPIR, CI-100	20-65%	Savings
• RESTROOMS - Ultrasonic sensors	30-75%	Savings
• CORRIDORS - CI-100-2, W2000H	30-60%	Savings

### Colleges & Schools

The Watt Stopper occupancy sensors have been very successful in elementary, secondary, and college applications. For schools we recommend:

• LARGE CLASSROOMS - DT-100L, W2000A, CI-100, CI-200	20-75%	Savings
• SMALL CLASSROOMS - W1000A, CI-100, WPIR	0-75%	Savings
• CORRIDORS - CI-100-2, W2000H	30-60%	Savings
• RESTROOMS - Ultrasonic sensors	35-75%	Savings
• TEACHERS OFFICES - WPIR, WI or WS series wall switches	30-50%	Savings
• GYM'S AND MULTIPURPOSE - DT-100L, CI-100	35-70%	Savings

### Retail & Hotels

The Watt Stopper occupancy sensors help you reduce energy costs while still meeting the special needs of your customers. For the most dramatic savings we recommend:

• STORAGE AREAS - DT-100L, Ultrasonic, WPIR, CI-100, CI-200	45-65%	Savings
• MEETING ROOMS - DT-100L, W500A, W1000A, CI-100, CI-200	40-65%	Savings
• WAREHOUSES - DT-100L, W2000A, CI-100, CI-200	50-75%	Savings

### HVAC, EMS, Light Level & Misc

HVAC and Energy Management Systems can be used in combination with any and all Watt Stopper products. Every sensor can be used to turn lighting on and off in addition to producing information or signals for the other systems.

- HVAC - Use the DT-100L, CI-100 or CI-200 for independent "on" and/or independent "off" for any area.
- EMS - The Watt Stopper sensors can be used to control lighting loads independently or in conjunction with EMS systems.
- Light Level - The DT-100L, CI-100 and CI-200 have a separate output to isolate a circuit for light level control.
- Cold Storage, Outdoor applications: CB-100, CB-200

The Watt Stopper\*, Inc.

2800 De La Cruz Blvd  
Santa Clara, CA 95050

Tel: (408) 988-5331

Fax: (408) 988-5373

National Technical Support  
Plano, Texas: (800) 879-8585

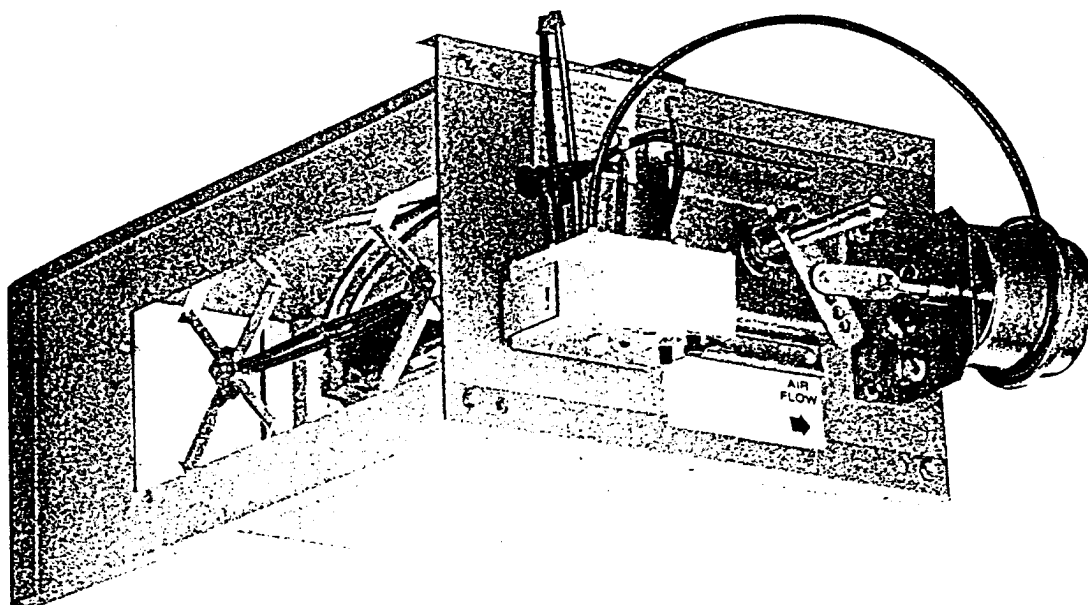
039 JC 4

# TITUS<sup>®</sup> Variable Volume Retrofit Terminals ▶ Description

## External Retrofit ■ Slides into Duct

### Models:

- PQCV ■ Pressure Independent Control ■ Pneumatic
- AQCV ■ Pressure Independent Control ■ Analog Electronic
- DQCV ■ Pressure Independent Control ■ Digital Electronic



► Converts constant volume systems to variable air volume. The resulting control performance approaches that of the current TITUS ESV Series single duct terminals.

► Easy, low cost installation into rectangular duct. The installer simply cuts a rectangular hole in the side of the duct, cuts away the insulation (if present), slides the unit into the duct, and screws the mounting plate to the side of the duct. Reinforcing angles are screwed to the top and bottom edges (see the illustration on the facing page).

► Pressure independent controls. Choice of pneumatic, analog, or digital electronic.

► TITUS multi-point, center averaging velocity sensor for accurate control even when duct velocities are not uniform across the duct cross section.

► Damper position is indicated by an arrow formed into the end of the damper shaft.

► Damper is constructed of 16 gauge galvanized steel.

► Elastomer seals on the long edges of the damper blades. The short edges of the damper blades seal against flexible metal strips in the sides of the casing.

► Damper shaft is supported in a stainless steel bearing.

► Leakage is less than 2% at 1.0".

► Gaskets under the mounting plate and at the end of the orifice plate seal the unit to the sides of the duct (see the illustration on the facing page).

► Reinforcing angles provide added duct stiffness at the insertion point.

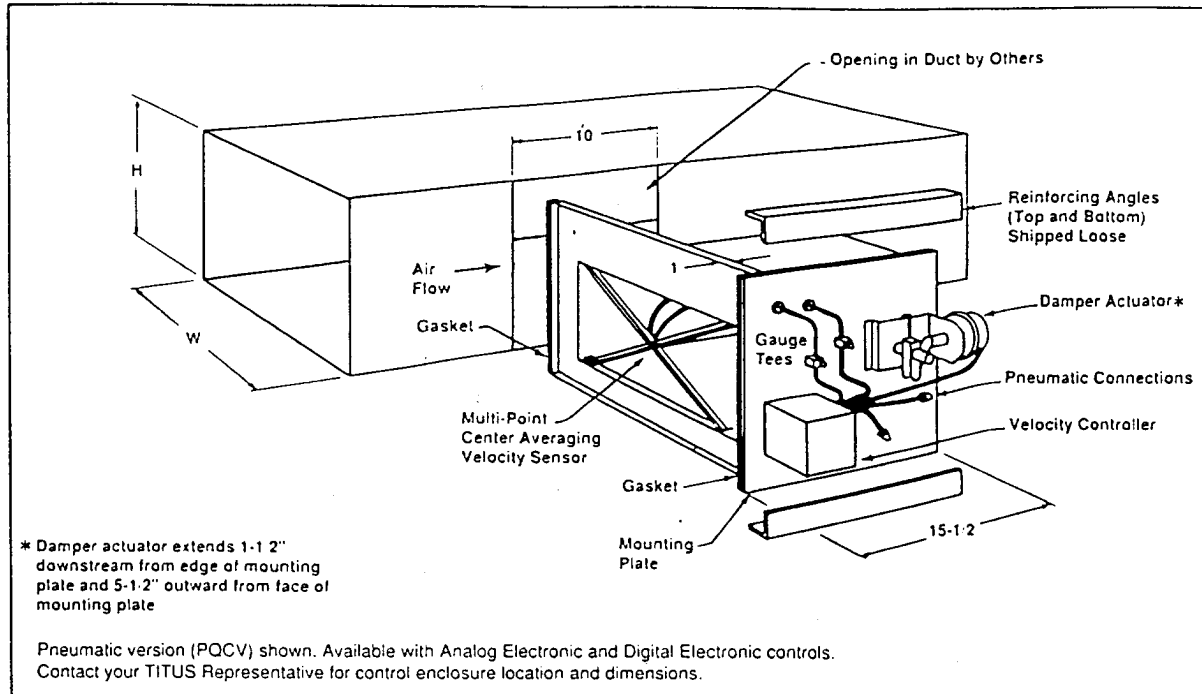
For further information on TITUS controls, please see the following pages in Catalog Section G:

Pneumatic:	G7 - G13
Analog electronic:	G15 - G17
Digital electronic:	G18 - G20



# TITUS® Variable Volume Retrofit Terminals ▶ Description

## QCV Series ■ Dimensions



## QCV Series ■ Available Duct Sizes

Unit Size	CFM Range*	Max ▲ CFM	Available Duct Sizes					
			Width W					Height H
A	0	100	5	6	8	10	12	5
	to	to	6	8	10	12		6
	200	200	6	8	10	12		8
B	0	150	6	8	10	12	14	6
	to	to	8	10	12	14		8
	300	300	10	12	14			10
C	0	200	8	10	12	14	16	6
	to	to	8	10	12	14	16	8
	400	400	8	10	12	14	16	10
D	0	350	10	12	14	16	18	8
	to	to	10	12	14	16	18	9
	700	700	10	12	14	16	18	10
E	0	500	14	16	18	20	22	8
	to	to	14	16	18	20	22	10
	1000	1000	14	16	18	20	22	12
F	0	500	18	20	22	24	26	6
	to	to	18	20	22	24	26	8
	1000	1000	18	20	22	24	26	10
G	0	600	12	14	16	18	20	10
	to	to	12	14	16	18	20	12
	1100	1100	12	14	16	18	20	13

Unit Size	CFM Range*	Max ▲ CFM	Available Duct Sizes					
			Width W					Height H
H	0	800	18	20	22	24	26	10
	to	to	18	20	22	24	26	12
	190	1900	18	20	22	24	26	14
J	0	1000	18	20	22	24	26	12
	to	to	18	20	22	24	26	14
	2400	2400	18	20	22	24	26	16
K	0	1350	20	22	24	26	28	14
	to	to	20	22	24	26	28	16
	3800	3800	20	22	24	26	28	18
L	0	1800	30	32	34	36		12
	to	to	30	32	34	36		14
	5400	5400	30	32	34	36		16
M	0	1750	22	24	26	28	30	16
	to	to	22	24	26	28	30	18
	5400	5400	22	24	26	28	30	20
N	0	2300	24	26	28	30	32	18
	to	to	24	26	28	30	32	20
	6700	6700	24	26	28	30	32	24
P	0	4000	30	32	34	36	38	20
	to	to	30	32	34	36	38	24
	10000	10000	30	32	34	36	38	26
R	0	5000	40	42	44	46	48	20
	to	to	40	42	44	46	48	24
	15000	15000	40	42	44	46	48	26

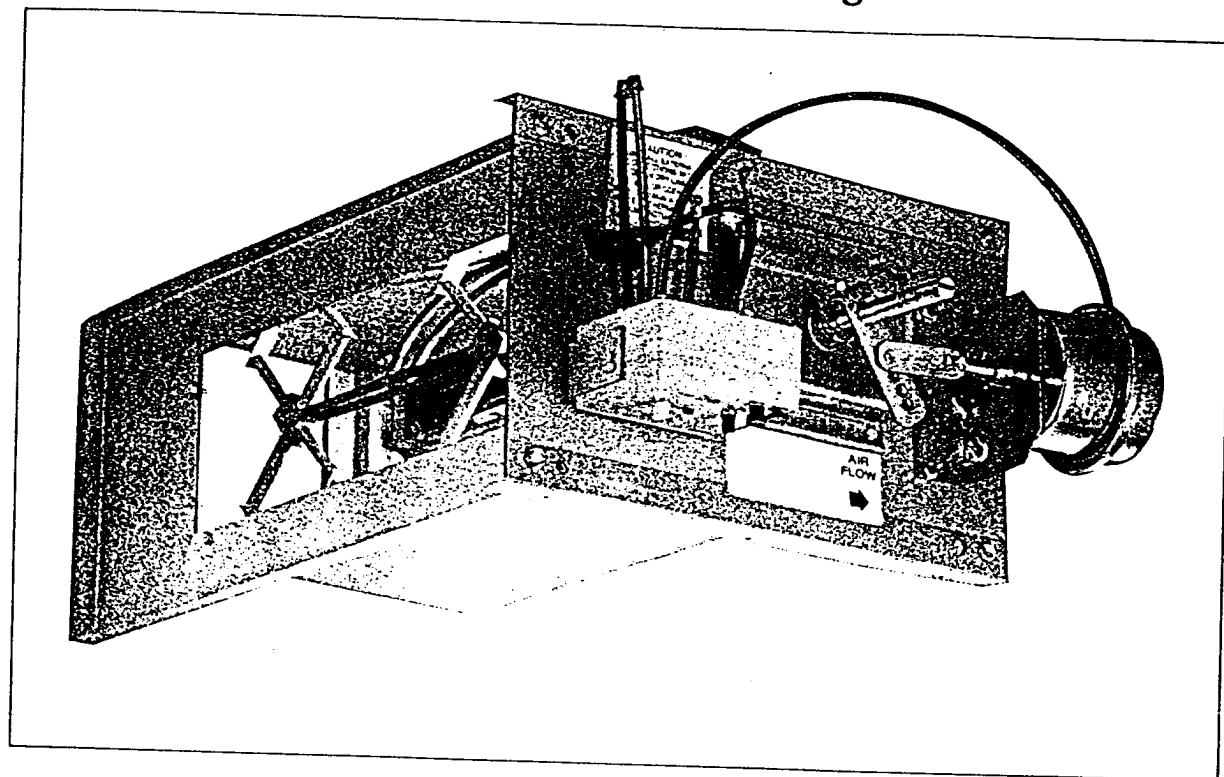
\* CFM range from zero minimum to the recommended maximum setting.

▲ Range of maximum cfm settings.

Note: See chart for flow ratings.

# TITUS<sup>®</sup> Variable Volume Retrofit Terminals ► Performance Data

## Model: PQCV ■ Recommended CFM Ranges



► Total CFM Range refers to the overall range of adjustment of the pneumatic velocity controller, from the lowest MIN setting to the highest MAX setting.

► Minimum CFM Range refers to the range of adjustment of the MIN setting of the pneumatic velocity controller.

► Maximum CFM Range refers to the range of adjustment of the MAX setting of the pneumatic velocity controller.

\*Note: Factory settings (except zero) will not be made below this range because control accuracy would be reduced.

Inlet Size	Total CFM Range	CFM Ranges of Minimum and Maximum Settings			
		TITUS II Controller		TITUS I Controller	
		Minimum	Maximum	Minimum	Maximum
A	0-200	*55-200	100-200	*75-200	100-200
B	0-300	*80-300	150-300	*105-300	150-300
C	0-400	*110-400	195-400	*140-400	195-400
D	0-700	*180-700	320-700	*230-700	320-700
E	0-1000	*260-1000	475-1000	*335-1000	475-1000
F	0-1000	*250-1000	455-1000	*325-1000	455-1000
G	0-1100	*280-1100	510-1200	*360-1100	510-1200
H	0-1900	*435-1775	795-2000	*565-1775	795-2000
J	0-2400	*540-2180	980-2400	*695-2180	980-2400
K	0-3800	*725-2945	1320-3800	*935-2945	1320-3800
L	0-5400	*980-3975	1780-5500	*1260-3975	1780-5500
M	0-5400	*970-3870	1735-5500	*1225-3870	1735-5500
N	0-6700	*1220-4975	2225-6700	*1575-4975	2225-6700
P	0-10,000	*1860-7500	3400-10,000	*2400-7500	3400-10,000
R	0-15,000	*2750-11,000	5000-15,000	*3500-11,000	5000-15,000

# TITUS® Variable Volume Retrofit Terminals ► Performance Data

## QCV Series ■ Application Data ■ NC Values

Unit Size	CFM	Min. $\Delta P_s$	Room Noise Criterion (NC)							
			Min. $\Delta P_s$		$\Delta P_s = 0.50$		$\Delta P_s = 1.00$		$\Delta P_s = 3.00$	
			Disch.	Rad.	Disch.	Rad.	Disch.	Rad.	Disch.	Rad.
A 100%	100	.10	—	—	27	—	35	23	48	38
	150	.23	—	—	28	—	36	24	49	39
	200	.40	17	—	*	*	37	25	49	40
B 100%	100	.05	—	—	24	—	35	23	48	38
	200	.17	—	—	27	—	36	24	49	39
	300	.38	19	—	*	*	37	25	49	40
C 100%	150	.04	—	—	25	—	31	21	45	35
	200	.07	—	—	27	—	33	23	48	38
	300	.14	—	—	28	—	34	24	49	39
	400	.25	19	—	*	*	35	25	49	39
D 50%	200	.05	—	—	21	—	30	21	42	35
	400	.20	—	—	24	—	33	24	49	39
	600	.44	—	—	25	—	34	24	46	40
	700	.60	—	—	*	*	34	25	46	41
E 40%	500	.14	—	—	23	—	31	22	48	38
	800	.36	—	24	—	—	33	24	49	39
	1000	.56	—	—	*	*	33	25	49	39
F 40%	500	.13	—	—	23	—	31	22	48	38
	800	.32	—	—	24	—	33	24	49	39
	1000	.50	—	—	*	*	33	25	49	39
G 30%	400	.08	—	—	20	—	29	19	40	36
	600	.18	—	—	23	—	31	22	42	38
	900	.39	—	—	23	—	32	23	43	39
	1100	.58	—	—	*	*	32	24	43	39
H 20%	800	.11	—	—	20	—	29	21	40	36
	1200	.25	—	—	21	—	29	22	41	39
	1600	.44	—	—	22	—	30	23	41	39
	1900	.61	—	—	*	*	30	24	42	40
J 15%	1000	.10	—	—	19	—	27	22	39	38
	1500	.23	—	—	20	—	27	23	40	38
	2000	.41	—	—	21	—	28	24	40	39
	2400	.59	19	—	*	*	28	25	41	40

Unit Size	CFM	Min. $\Delta P_s$	Room Noise Criterion (NC)							
			Min. $\Delta P_s$		$\Delta P_s = 0.50$		$\Delta P_s = 1.00$		$\Delta P_s = 3.00$	
			Disch.	Rad.	Disch.	Rad.	Disch.	Rad.	Disch.	Rad.
K 10%	2000	.17	—	—	—	—	26	23	33	38
	2700	.30	—	—	19	—	27	23	33	38
	3350	.46	—	—	19	—	28	24	34	39
	3800	.59	21	—	*	*	28	25	34	40
L 10%	2750	.05	—	—	—	—	26	23	38	38
	3700	.17	—	—	13	—	26	24	39	39
	4650	.38	—	—	19	—	27	24	39	40
	5400	.29	—	—	19	—	27	25	39	40
M 10%	2700	.10	—	—	18	—	26	23	38	38
	3600	.18	—	—	19	—	26	23	39	39
	4500	.28	—	—	19	—	27	24	39	40
	5400	.40	19	—	20	—	27	25	39	41
N 10%	2300	.14	—	—	18	—	25	22	37	38
	3400	.36	—	—	19	—	26	22	38	38
	4500	.56	—	—	19	—	26	23	39	39
	5600	.22	—	—	19	—	27	24	39	39
	6700	.31	—	—	20	—	27	25	39	41
P 5%	3400	.13	—	—	—	—	—	21	24	37
	5200	.32	—	—	—	—	—	22	25	38
	7000	.50	—	—	—	—	—	23	26	39
	8800	.28	—	—	—	—	—	24	26	40
	10,000	.36	—	—	—	—	—	25	27	41
R 5%	7500	.11	—	—	—	—	—	21	25	34
	10,000	.20	—	—	—	—	—	22	26	35
	12,500	.32	—	—	—	—	—	23	26	35
	15,000	.45	—	—	—	—	—	24	27	36

- $\Delta P_s$  is the difference in static pressure from inlet to discharge, in inches wg.
- Minimum  $\Delta P_s$  is the lowest inlet-to-discharge static pressure difference (damper wide open).
- Dash (—) in a space indicates an NC value less than 18.
- Asterisk (\*) in a space indicates that the minimum  $\Delta P_s$  for that cfm is greater than 0.5" wg.
- Each NC value represents the noise criterion which will not be exceeded by

the sound pressure in any of the octave bands, 2 through 7, for the cfm shown.

- Discharge NC is the noise criterion which will not be exceeded by terminal-generated noise transmitted along the downstream duct. Based on:
  - a. 10 dB room absorption, re  $10^{-12}$  watts.
  - b. 10" diameter, internally insulated discharge duct, 10' long.
  - c. One outlet, handling the per cent total air flow shown in the Unit Size column.
- Radiated NC is the noise criterion which will not be exceeded by noise

transmitted through the terminal casing walls. Based on:

- a. 10 dB room absorption, re  $10^{-12}$  watts.
- b. Ceiling sound transmission class 35-39.
- c. Duct constructed of 22 gauge galvanized steel lined with 1", 4 lb. density, matted fiberglass.

Note: If the terminal is exposed, add 13 NC.

For some typical applications, please see the next page.

# TITUS® Variable Volume Retrofit Terminals ▶ Applications

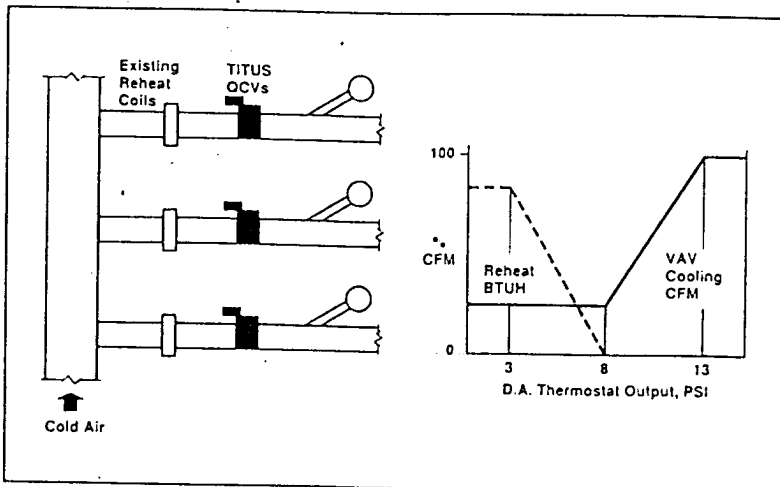
## Model: PQCV ■ Applications

### Low Pressure, Constant Volume Reheat System

Cold air from the central air handler is distributed through the original main trunk and branch ducts. The new TITUS PQCV retrofit terminals convert the system to variable air volume operation.

Each PQCV terminal is signaled by a direct acting thermostat. In the example shown in the diagram, the pressure independent minimum air flow is set at a thermostat output pressure of 8 psi or less, while the maximum is set at 13 psi or greater.

The existing reheat coil in each zone is actuated on a fall in room temperature, as the thermostat output decreases from 8 to 3 psi.



### Multizone System

Hot or cold air from the central multizone air handler is distributed through the original zone ducts. The new TITUS PQCV retrofit terminals convert the system to variable air volume operation.

The multizone dampers provide a mixed air flow temperature of air at minimum air flow. The PQCV valves provide VAV and pressure independent flow. Very little work is required to convert a multizone pressure dependent set of zones to an energy saving series of VAV zones. Each zone now has fixed maximum and minimum air flow without system hunting.

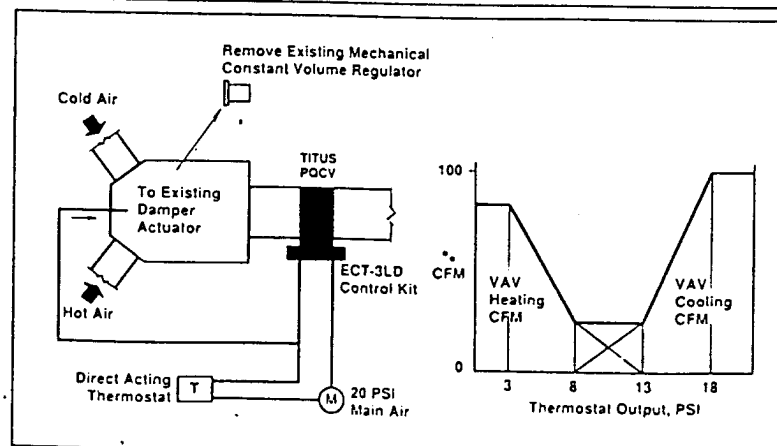
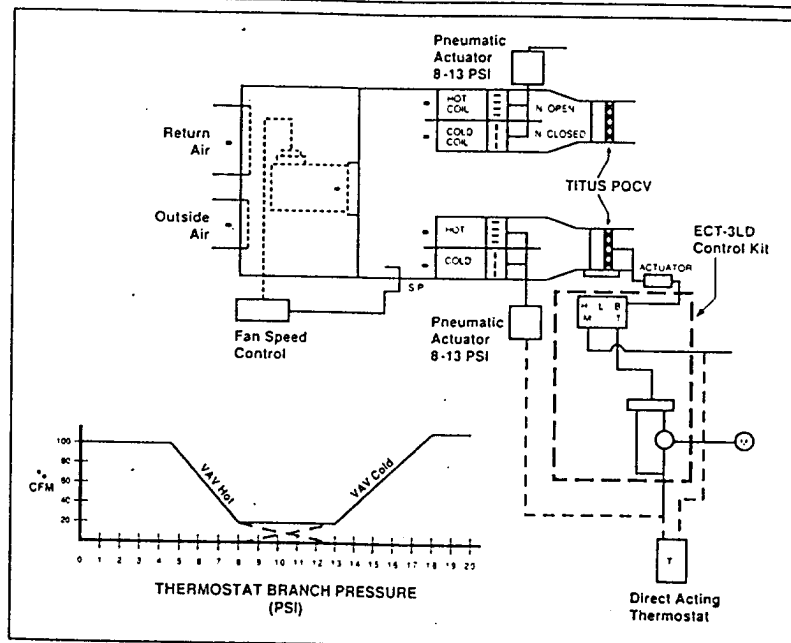
### Dual Duct System

Hot and cold air from the central air handler is distributed through the original supply ducts and terminals. The new TITUS PQCV retrofit terminals convert the system to variable air volume operation.

The mechanical constant volume regulator is removed from each existing terminal, while a PQCV is installed in the discharge duct. A direct acting thermostat controls both the PQCV and the modulating splitter damper in the existing terminal.

On a rise in room temperature, the PQCV reduces the hot air flow. At the minimum air flow setting, the damper in the existing unit, which in this example has an 8-13 psi actuator, begins to modulate, and some mixing occurs. A further temperature rise increases the cold air flow to the maximum.

Since the total air volume is reduced, the fan may need to be slowed down.



# TITUS® Variable Volume Retrofit Terminals ► Applications

## Dual Duct Applications ■ ECT-TI/TH, ECT-AN, ECT-BC, ECT-BU, ECT-CN, ECT-KR, ECT-TB

In Diagram A, the original dual duct terminal has been converted to single duct, cooling only, to serve an interior zone.

Notice that the hot duct connection has been capped. The damper is normally closed with respect to the cold air duct. Since the main control air feeds directly into the existing damper actuator, the damper goes full open when the main control air is turned on. The TITUS ECT-3LS then provides pressure independent VAV control.

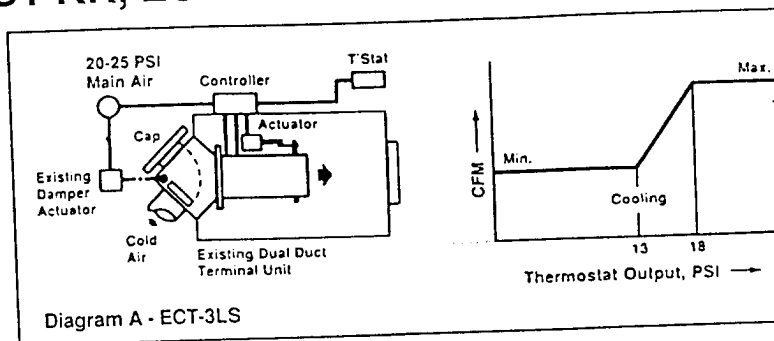


Diagram A - ECT-3LS

In Diagram B, the dual duct function is retained for use in an interior or exterior zone. The TITUS ECT-3LS provides pressure independent control for both cooling and heating. Cooling is variable air volume, while heating is constant air volume at the minimum cfm setting of the TITUS II controller. The original inlet damper modulates from 100% cold to 100% hot as the thermostat calls for more heat.

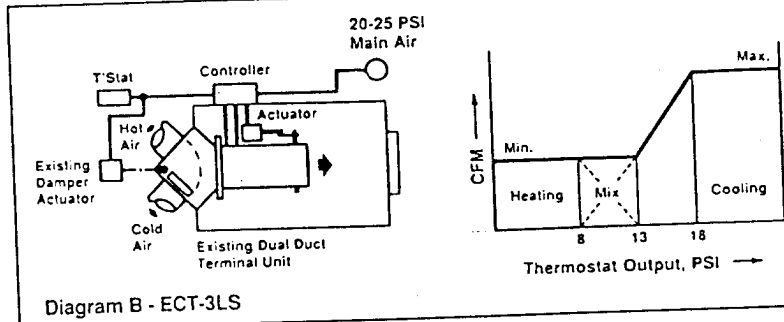


Diagram B - ECT-3LS

In Diagram C, the addition of a reversing relay and a high pressure selector allows pressure independent VAV control of heating, as well as cooling, in the dual duct unit.

In this example the reversing relay bias is set at 10.5 psi. The TITUS ECT-3LD is set for minimum cooling cfm at 13 psi thermostat output pressure. From 13 to 8 psi the original dual duct unit damper modulates from 100% cooling to 100% heating, so that there is mixing at the minimum cfm. From 8 to 3 psi the TITUS control modulates from minimum to maximum heating cfm.

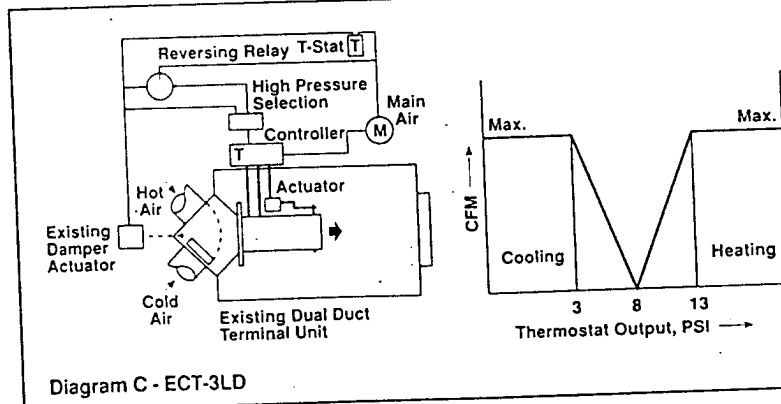


Diagram C - ECT-3LD

In Diagram D, the physical hookup is the same as in C, except for the addition of a snap acting diverting relay with its own air supply.

Here both the reversing relay bias and the ECT-4LD start point are set at 8 psi. The ECT-4LD is also set for a minimum cfm of zero. The original dual duct unit damper snaps from 100% cooling to 100% heating at 8 psi. Below 8 psi this damper remains in full heating position, while the TITUS control modulates from minimum to maximum heating cfm.

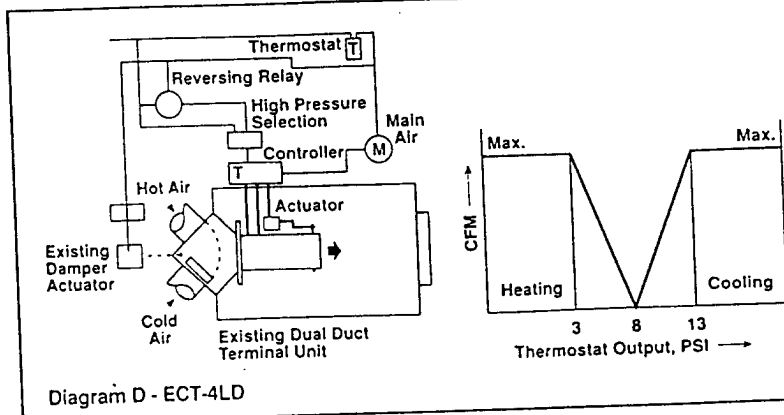


Diagram D - ECT-4LD

Note: For a typical single duct application for any internal retrofit valve kit, see page J24.

# Century® Three Phase • Integral Horsepower Motors



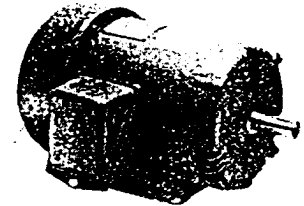
**Squirrel Cage • Totally-Enclosed  
Fan-Cooled • Rigid Base • 3600,  
1800 and 1200**

**1 thru 30 HP**

"N" prefix motors manufactured in Lexington,  
Tennessee. "T" prefix catalog motors  
manufactured by MagneTek in Europe.

**Features:** Ball Bearing • 60 HZ • 40° C  
Ambient • Class F Insulated • Service Factor  
1.15 • Continuous Duty • NEMA Design B

**Applications:** Designed to stand up to abusive  
treatment ... moist, dirty, dusty, and factory  
atmospheres.



DIMENSION DRAWING ON PAGE 69

HP	RPM	Volts	Frame	Full Load Amps	Power Factor	Efficiency	Shpg. Wt. #	Cat. No.	List Price D-1
1	1800	230/460	143T	3.6/1.8	78.0	68.0	45	T164	\$ 210.00
		575	143T	1.4	78.0	68.0	45	T167	
	1200	230/460	145T	5.2/2.6	56.0	66.0	54	T198	259.00
		230/460	143T	5.0/2.5	87.0	66.0	54	T199	216.00
1½	3600	575	143T	2.0	87.0	66.0	51	T196	216.00
		230/460	145T	5.0/2.5	78.0	74.0	58	T165	227.00
	1800	575	145T	2.0	78.0	74.0	50	T168	227.00
		230/460	S182T	5.1-5.4/2.7	72.0	80.0	51	(2) N204	347.00
	1200	230/460	182T	5.2/2.6	70.0	80.0	75	T264	280.00
		230/460	145T	6.0/3.0	85.0	74.0	55	T129	252.00
2	3600	575	145T	2.4	85.0	74.0	55	T197	252.00
		230/460	145T	6.8/3.4	75.0	74.0	55	T166	246.00
	1800	575	145T	2.7	75.0	74.0	54	T169	246.00
		230/460	S184T	6.4-6.0/3.0	78.0	82.5	64	(2) N205	368.00
	1200	230/460	184T	6.6/3.3	72.0	82.5	84	T265	311.00
		230/460	S182T	8.6-8.0/4.0	90.5	80.0	61	(2) N202	345.00
3	3600	230/460	182T	7.8/3.9	90.0	82.5	88	T262	288.00
		575	S182T	3.3	90.5	80.0	60	(2) N247	345.00
	1800	575	182T	3.1	90.0	82.5	88	T272	288.00
		200-208	S182T	9.2	84.0	84.0	61	(2) N214	320.00
	230/460	208-230/460	S182T	8.5-8.2/4.1	84.0	84.0	61	(2) N200	320.00
		575	182T	9.6/4.8	73.0	82.5	77	T247	286.00
	1200	575	S182T	3.3	84.0	84.0	60	(2) N234	320.00
		208-230/460	182T	3.8	73.0	82.5	77	T270	286.00
	230/460	230/460	F213T	10.2-10.0/5.0	67.0	82.5	83	N300	466.00
		230/460	213T	9.0/4.5	78.0	84.0	119	T362	387.00
5	3600	208-230/460	L184T	13.2-12.0/6.0	88.3	85.5	79	(2) N203	396.00
		230/460	184T	12.0/6.0	92.0	85.5	99	T263	362.00
	1800	575	L184T	5.0	88.3	85.5	79	(2) N248	396.00
		575	184T	4.8	92.0	85.5	99	T273	362.00
	230/460	200-208	L184T	15.0	83.0	86.5	84	(2) N215	364.00
		208-230/460	L184T	14.3-13.0/6.5	83.0	86.5	84	(2) N201	364.00
	1200	230/460	184T	13.6/6.8	84.0	84.0	90	T250	323.00
		575	L184T	5.2	83.0	86.5	83	(2) N235	364.00
	230/460	575	184T	5.3	84.0	84.0	90	T271	323.00
		208-230/460	F215T	17.5-17.0/8.5	70.0	85.5	106	N301	669.00
	230/460	230/460	215T	15.0/7.5	77.0	85.0	147	T363	584.00
		230/460	S213T	20.5-18.6/9.3	89.0	87.5	105	(2) N302	561.00
7½	3600	230/460	213T	18.0/9.0	93.0	86.5	121	T360	457.00
		575	F213T	8.5	88.5	80.0	93	(1)(4) N333	561.00
	1800	575	213T	7.0	93.0	86.5	121	T366	457.00
		200-208	S213T	23.0-23.0	81.2	82.4	130	(2) N316	479.00
	230/460	230/460	S213T	21.0/10.5	79.0	87.5	100	(2) N303	479.00
		575	213T	18.6/9.3	84.0	88.5	128	T345	436.00
	1200	575	S213T	8.4	79.0	88.5	105	(2) N321	479.00
		230/460	213T	7.3	84.0	88.5	128	T364	436.00
	230/460	230/460	S254T	23.0/11.5	73.0	86.5	220	(2) N400	988.00
		230/460	254T	20.0/10.0	80.0	88.5	220	T470	802.00
10	3600	208-230/460	S215T	25.0-24.8/12.4	89.0	87.5	121	(2)(3) N304	635.00
		230/460	215T	24.0/12.0	93.0	86.5	139	T361	544.00
	1800	575	F215T	10.0	90.5	85.5	112	(1)(4) N334	635.00
		575	215T	9.0	93.0	86.5	139	T367	544.00
	230/460	200-208	F215T	29.0-29.0	85.5	87.5	110	(1)(4) N317	587.00
		208-230/460	F215T	28.0-25.6/12.8	85.5	87.5	110	N305	587.00
	1200	230/460	215T	24.8/12.4	85.0	88.5	158	T348	519.00
		575	F215T	10.2	85.5	87.5	110	(1)(4) N322	587.00
	230/460	575	215T	9.9	85.0	88.5	158	T365	519.00
		230/460	F256T	28.0/14.0	76.0	88.5	228	N401	1167.00
	230/460	230/460	256T	27.0/13.5	80.0	88.5	264	T471	986.00
		230/460	F254T	34.8/17.4	91.0	85.7	187	N402	944.00
15	3600	230/460	254T	36.0/18.0	93.0	86.5	209	T468	762.00
		575	254T	15.2	86.0	87.5	209	T474	762.00
	1800	230/460	S254T	37.0/18.5	86.0	88.5	216	(2) N403	879.00
		230/460	254T	36.0/18.0	89.0	89.5	233	T445	751.00
	1200	575	F254T	16.0	81.3	86.4	193	(1)(4) N430	879.00
		230/460	254T	14.0	89.0	89.5	233	T472	751.00
	230/460	230/460	284T	38.0/19.0	80.0	89.5	374	T562	1349.00

(continued on page 13)

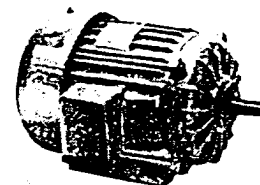
# Louis Allis Pacemaker® Three Phase Integral Horsepower Motors



Squirrel Cage • Totally-Enclosed  
Fan-Cooled • Rigid Base •  
3600, 1800 and 1200 RPM  
1½ thru 400 HP

Features: Ball Bearing • 60 HZ • 40° C  
Ambient • Class F Insulated • Service Factor  
1.15 • Continuous Duty • NEMA Design B

Applications: Designed to stand up to abusive  
treatment . . . moist, dirty, dusty, and factory  
atmospheres.



DIMENSION DRAWING ON PAGE 69

HP	RPM	Volts	Frame	Full Load Amps	Efficiency	Power Factor	Shpg. Wt. #	Cat. No.	List Price D-1
									\$
1½	1200	230/460	182T	5 2/2.6	80.0	67.5	76	N273	417.00
2	1200	230/460	184T	6 4/3.2	82.5	78.0	94	N283	465.00
3	3600	230/460	182T	8 2/4.1	80.0	90.5	79	N274	430.00
	200-208	182T		10 4/10.4	81.5	83.5	77	N271	405.00
	1800	230/460	182T	8 8/4.4	81.5	83.5	77	N270	405.00
	1200	230/460	213T	9 6/4.8	82.5	72.0	140	N373	536.00
5	3600	230/460	184T	13 4/6.7	81.5	92.0	97	N284	519.00
	200-208	184T		15 5/15.5	82.5	83.5	95	N281	451.00
	1800	230/460	184T	14 0/7.0	82.5	83.5	90	N280	451.00
	1200	230/460	215T	17 0/8.5	85.5	70.0	169	N383	771.00
7½	3600	230/460	213T	20 0/10.0	80.0	88.5	140	N374	713.00
	200-208	213T		22 1/21.7	86.5	83.0	130	N371	646.00
	1800	230/460	213T	19 6/9.8	86.5	83.0	130	N370	646.00
	1200	230/460	254T	24 0/12.0	86.5	72.0	249	N473	1147.00
10	3600	230/460	215T	25 0/12.5	85.5	90.5	171	N384	780.00
	200-208	215T		29 0/29.0	87.5	85.5	171	N381	705.00
	1800	230/460	215T	25 6/12.8	87.5	85.5	171	N380	705.00
	1200	230/460	256T	28 0/14.0	88.5	76.0	287	N483	1402.00
15	3600	230/460	254T	36 0/18.0	87.5	90.0	243	(4) N474	1088.00
	200-208	254T		38 0/19.0	87.5	85.0	253	N470	1060.00
	1800	230/460	284T	44 0/22.0	88.5	75.0	352	N573	1866.00
	1200	230/460	284T						
20	3600	230/460	256T	44 0/22.0	87.5	93.0	266	N484	1269.00
	200-208	256T		48 0/24.0	89.5	87.5	297	N480	1261.00
	1800	230/460	286T	55 0/27.5	89.5	79.0	372	N583	2379.00
	1200	230/460	286T						
25	3600	230/460	284TS	60 0/30.0	87.5	90.5	346	N574	1589.00
	200-208	284T		60 0/30.0	89.5	87.0	344	N570	1470.00
	1800	230/460	324T	72 0/36.0	88.3	73.6	455	N602	2448.00
	1200	230/460	324T						
30	3600	230/460	286TS	70 0/35.0	87.5	93.0	394	N584	1829.00
	200-208	286T		70 0/35.0	90.2	88.5	399	N580	1737.00
	1800	230/460	326T	82 0/41.0	90.2	77.0	550	N603	2701.00
	1200	230/460	326T						
40	3600	230/460	324TS	94 0/47.0	87.5	91.0	506	N620	2262.00
	200-208	324T		97 0/47.5	91.7	86.5	434	N600	2208.00
	1800	575	324T	38.0	91.7	86.5	434	N606	2208.00
	1200	230/460	364T	96 0/48.0	89.1	87.6	650	N704	4291.00
50	3600	230/460	326TS	116 0/58.0	88.5	94.0	552	(4) N621	2912.00
	200-208	326T		120 0/60.0	92.4	89.0	521	N601	2506.00
	1800	575	326T	46.0	92.4	89.0	521	N607	2506.00
	1200	230/460	365T	122 0/61.0	92.4	83.0	690	N705	4683.00
	900	230/460	404T	128 0/64.0	91.7	82.0	1245	N757	6968.00
60	3600	230/460	364TS	136 0/68.0	90.2	92.0	740	N687	4015.00
	200-208	364T		140 0/70.0	91.0	89.0	770	N700	3851.00
	1800	575	364T	56.0	91.0	89.0	777	N685	3851.00
	1200	230/460	404T	150 0/75.0	89.3	85.0	1213	N752	5769.00
	900	230/460	405T	150 0/75.0	91.7	84.0	1290	N756	7198.00
75	3600	230/460	365TS	164 0/82.0	92.4	93.0	685	N688	5228.00
	200-208	365T		168 0/84.0	93.0	90.0	865	N701	4621.00
	1800	575	365T	67.0	93.0	90.0	887	N684	4621.00
	1200	230/460	405T	174 0/87.0	93.0	89.0	1353	N753	6521.00
	900	230/460	444T	182 0/91.0	93.6	83.0	1555	(4) N849	9746.00
100	3600	230/460	405TS	230 0/115.0	89.5	93.0	1290	N755	6846.00
	200-208	405T		230 0/115.0	91.7	91.5	1132	(4) N751	6234.00
	1800	575	405T	92.0	91.7	91.5	1132	(4) N750	6234.00
	1200	230/460	444T	224 0/112.0	93.0	91.0	1707	N830	8697.00
	900	460	445T	120.0	93.0	84.0	1738	(1)(4) N848	12526.00
125	3600	460	444TS	140.0	89.5	96.0	1775	(2)(4) N846	9217.00
	200-208	444T		142.0	91.7	91.0	1630	(2) N828	7980.00
	1800	575	444T	114.0	91.7	91.0	1605	N850	7980.00
	1200	460	445T	154.0	94.1	83.0	1878	(2) N832	10633.00

(continued on page 15)

# Louis Allis Spartan® (Premium Efficiency) Severe Duty Motors

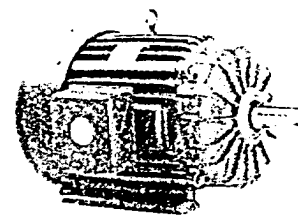
MagneTek

## Premium Efficiency

Squirrel Cage • TEFC • Rigid Base  
• 3600, 1800 & 1200 RPM

1-400 HP

Features: Premium Efficiency • All Cast Iron Construction • 1.15 Service Factor • Class F Insulated • Continuous Duty • 60 HZ • Corrosion Resistant Fan • Multiple Dips and Bakes Non Hygroscopic varnish • Plated Hardware • Shielded Bearings • Shaft Slinger • Automatic Drain/Breather • Fully Gasketed Conduit Box • Stainless Steel Nameplate • Regreasable While Running • Grease Fittings • Ground Lug in Conduit Box • Provision for mounting "Inproseal" (360 Frame and larger).  
**3 Year Warranty.**



DIMENSION DRAWING ON PAGE 69

HP	RPM	Volts	Frame	Full Load Amps	Efficiency	Power Factor	Shpg. Wt. #	Cat. No.	List Price D-1
1	1800	230/460	143T	3 2/1.6	78.5	78.0	49	(3) ▲ S107	\$ 289.00
	1200	230/460	145T	4 0/2.0	72.0	64.0	66	(3) ▲ S110	357.00
								▲ S111	294.00
1 1/2	3600	230/460	143T	4 4/2.2	72.0	88.0	50	(3) ▲ S108	302.00
	1800	230/460	143T	4 4/2.2	81.5	80.0	60	▲ S205	549.00
	1200	230/460	182T	6 0/3.0	80.0	62.0	100	▲ S112	347.00
2	3600	230/460	145T	5 8/2.9	77.0	87.0	60	▲ S109	323.00
	1800	230/460	145T	6 0/3.0	81.5	78.0	60	▲ S207	597.00
	1200	230/460	184T	6 3/3.15	82.5	71.0	115	▲ S208	399.00
3	3600	230/460	182T	8 0/4.0	81.0	83.0	87	▲ S204	383.00
	1800	230/460	182T	8 8/4.4	85.5	75.5	82	▲ S305	764.00
	1200	230/460	213T	9 0/4.5	86.5	69.7	172	▲ S209	485.00
5	3600	230/460	184T	12 0/6.0	86.5	90.5	107	▲ S205	453.00
	1800	230/460	184T	13 4/6.7	85.5	82.0	100	▲ S306	1060.00
	1200	230/460	215T	14 5/7.25	87.5	74.1	200	S307	919.00
7 1/2	3600	230/460	213T	18 0/9.0	88.5	83.4	172	S303	919.00
	1800	230/460	213T	19 0/9.5	87.5	82.1	172	S442	1416.00
	1200	230/460	254T	22 0/11.0	90.2	71.0	296	S308	1051.00
10	3600	230/460	215T	23 0/11.5	90.2	89.9	200	S304	1078.00
	1800	230/460	215T	25 0/12.5	89.5	85.2	200	S443	1729.00
	1200	230/460	256T	28 0/14.0	90.2	74.5	333	S444	1372.00
15	3600	230/460	254T	35 0/17.5	91.7	88.3	296	S440	1350.00
	1800	230/460	254T	36 0/18.0	91.0	87.0	296	S502	2408.00
	1200	460	284T	20.0	92.4	76.0	451	S445	1698.00
20	3600	230/460	256T	45 0/22.5	92.4	90.0	386	S441	1682.00
	1800	230/460	256T	47 0/23.5	91.7	88.0	386	S503	2795.00
	1200	460	286T	25.0	92.4	82.0	514	S504	2095.00
25	3600	460	284TS	30.5	92.4	82.8	460	S500	2000.00
	1800	460	284T	28.5	93.0	83.0	450	S602	3406.00
	1200	460	324T	31.0	93.0	80.0	705	S505	2448.00
30	3600	460	286TS	33.5	93.0	91.0	514	S501	2325.00
	1800	460	286T	34.0	93.0	89.0	514	S603	3924.00
	1200	460	326T	38.0	93.0	79.4	756	S604	3244.00
40	3600	460	324TS	48.5	94.1	84.2	705	S600	3105.00
	1800	460	324T	47.0	93.6	80.1	705	• S678	5318.00
	1200	460	364T	50.0	93.6	82.0	840	S605	4196.00
50	3600	460	326TS	59.0	94.1	84.2	756	S601	3812.00
	1800	460	326T	61.0	94.1	81.7	756	• S679	6105.00
	1200	460	365T	63.0	93.6	81.0	910	S680	5521.00
60	3600	460	364TS	66.0	94.1	92.0	840	(1) S676	5472.00
	1800	460	364T	67.0	94.1	89.0	840	• S752	7154.00
	1200	460	404T	72.0	94.1	83.0	1120	(1) S681	6932.00
75	3600	460	365TS	80.0	94.5	93.0	910	(1) S677	6936.00
	1800	460	365T	83.0	94.5	90.0	910	• S753	8423.00
	1200	460	405T	90.0	94.1	84.0	1403	S754	9289.00
100	3600	460	405TS	109.0	94.5	93.5	1403	(1) S751	8572.00
	1800	460	405T	114.0	95.0	88.0	1403	• S828	11511.00
	1200	460	444T	123.0	95.0	84.0	1760	• S830	12142.00
125	3600	460	444TS	132.0	95.0	93.0	1760	• S826	11284.00
	1800	460	444T	140.0	95.4	89.0	1760	• S829	14139.00
	1200	460	445T	152.0	95.0	83.0	2050	• S831	14587.00
150	3600	460	445TS	159.0	95.0	96.0	2050	• S827	12452.00
	1800	460	445T	165.0	95.4	90.0	2050	• S881	15817.00
	1200	460	447T	177.0	95.0	84.0	2200	• S886	18450.00
200	3600	460	447TS	212.0	95.0	95.0	2200	(1) S876	15954.00
	1800	460	447T	220.0	95.4	90.0	2200	• S882	19364.00
	1200	460	447T	232.0	95.0	85.0	2500	• S887	23269.00
250	3600	460	447TS	263.0	95.8	93.0	2200	• S877	20015.00
	1800	460	447T	279.0	95.8	89.0	2200	• S883	22112.00
	1200	460	449T	292.0	95.4	84.0	2500	• S888	29711.00
300	3600	460	449TS	315.0	95.8	93.0	2500	• S878	22702.00
	1800	460	449T	325.0	95.8	91.0	2500	• S884	26533.00
	1200	460	449T	340.0	95.0	85.0	2500	• S889	33870.00
350	3600	460	449TS	368.0	95.8	93.0	2500	• S879	24731.00
	1800	460	449T	375.0	95.8	91.0	2500	(2) • S885	33675.00
	1200	460	449T	410.0	95.0	85.0	2500	• S890	38496.00
400	3600	460	449TS	420.0	95.8	93.0	2500	(2) • S880	31555.00
	1800	460	449T	430.0	95.8	91.0	2500		

Notes: (1)—NEMA Design A. (2)—1.0 Service Factor. (3)—Totally Enclosed Non-Ventilated • —Not normally stocked ▲ —Not domestically manufactured



# Century E-plus® Inverter-Duty Motors

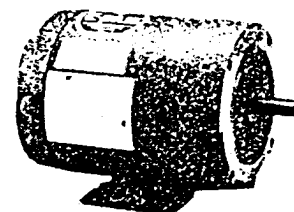


Three Phase • TENV & TEFC •  
Rigid Base • 1800 & 1200 RPM  
1/4 thru 5 HP



Features: Ball Bearing • 60 HZ • 40° C  
Ambient • Class B Insulated • Reversible •  
Energy Efficient • NEMA Design B

Applications: Especially designed for use with  
Adjustable Speed Controls



## Fractional HP Inverter-Duty

DIMENSION DRAWING ON PAGE 70

HP	RPM	Volts	Frame	Enclosure	Service Factor	Full Load Amps	Shpg. Wt. #	Cat. No.	List Price C-7A
1/4	1800	208-230/460	B56C	TENV	1.00	1.2-1.1/55	20	E183	\$214.00
	1200	208-230/460	H56C	TENV	1.00	1.3-1.2/6	21	E184	330.00
1/3	1800	208-230/460	H56C	TENV	1.00	1.2-1.2/6	22	E182	222.00
	1200	208-230/460	J56C	TENV	1.00	1.7-1.6/8	25	E185	346.00
1/2	1800	208-230/460	J56C	TENV	1.00	1.6-1.8/9	25	E181	268.00
	1200	208-230/460	J56C	TENV	1.00	2.1-2.0/1.0	29	E186	374.00
3/4	1800	208-230/460	K56C	TENV	1.00	2.3-2.2/1.1	30	E180	294.00
	1200	208-230/460	J56C	TEFC	1.00	3.1-3.1/1.55	33	E187	384.00

## Integral HP Inverter-Duty

HP	RPM	Volts	Frame	Enclosure	Service Factor (1)	Full Load Amps	Efficiency	Power Factor	Shpg. Wt. #	Cat. No.	List Price D-1
<b>Standard Bracket</b>											
1	1800	230/460	L143T	TEFC	1.15	2.7/1.35	82.5	84.0	38	E120	\$342.00
2	1800	230/460	P145T	TEFC	1.15	5.58/2.79	84.0	80.0	49	E116	446.00
3	1800	230/460	F182T	TEFC	1.15	7.6/3.8	86.5	85.5	62	E292	520.00
5	1800	230/460	F184T	TEFC	1.15	12.4/6.2	87.5	86.5	72	E293	594.00
<b>NEMA "C" Bracket</b>											
1	1800	230/460	M143TC	TEFC	1.15	2.7/1.35	82.5	84.0	39	E140	\$441.00
2	1800	230/460	P145TC	TEFC	1.15	5.58/2.79	84.0	80.0	49	E113	515.00
3	1800	230/460	F182TC	TEFC	1.15	7.6/3.8	86.5	85.5	73	E236	687.00
5	1800	230/460	F184TC	TEFC	1.15	12.4/6.2	87.5	86.5	85	E237	814.00

Notes: (1)—Service Factor 1.0 when used on non-sinusoidal voltage wave forms.

## Variable Volume Inverter-Duty Motors Three Phase

Dripproof • Rigid Base • 1800 RPM  
1 thru 150 HP



Features: Ball Bearings • 60 HZ • 40° C  
Ambient • Class F Insulated • Designed specifically for use with A/C Adjustable Speed Controllers on Variable Torque Loads. 20 thru 60 HZ from PWM or Six Step Inverters. • Maximum efficiency at 1/2 load point. • 1.0 Service Factor on non-sinusoidal power. • 1.15 Service Factor on 60 HZ sinusoidal power. • 1.0 Service Factor on 60 HZ sinusoidal power at 55° C Ambient, 230/460 only.

DIMENSION DRAWING ON PAGE 69



HP	RPM	Volts	Frame	Efficiency	Power Factor	Full Load Amps	Shpg. Wt. #	Cat. No.	List Price D-1
1	1800	208-230/460	N143T	82.5	84.0	3.0-2.7/1.35	38	(1)+ E188	\$ 360.00
2	1800	208-230/460	P145T	84.0	85.7	5.4-5.2/2.6	42	(1)+ E190	431.00
5	1800	208-230/460	E184T	85.5	89.0	14.6-12.6/6.3	91	E281	483.00
7½	1800	208-230/460	D213T	89.5	86.5	21.0-18.8/9.4	132	E380	709.00
10	1800	208-230/460	H215T	89.5	85.0	28.0-25.0/12.5	147	E381	863.00
15	1800	208-230/460	G254T	91.7	88.0	40.0-36.0/18.0	230	E480	1162.00
20	1800	208-230/460	G256T	91.0	87.0	54.0-48.0/24.0	220	E481	1402.00
25	1800	208-230/460	E284T	93.0	88.5	64.0-58.0/29.0	311	E580	1647.00
30	1800	208-230/460	S286T	93.0	90.5	75.0-68.0/34.0	352	E581	1934.00
40	1800	208-230/460	E324T	93.6	88.0	102.0-92.0/46.0	450	E680	2543.00
50	1800	208-230/460	S326T	93.0	89.5	128.0-114.0/57.0	509	E681	2966.00
60	1800	460	364T	94.1	90.5	67.0	796	(2) E682	3720.00
75	1800	460	365T	94.5	90.0	83.9	825	(2) E683	4431.00
100	1800	460	404T	95.4	86.0	114.1	1000	• (2) E780	5901.00
125	1800	460	405T	95.4	88.0	139.4	1153	• (2) E781	7004.00
150	1800	460	444T	95.0	87.5	172.0	1236	• (2) E880	9232.00

Notes: (1)—Class B Insulated  
(2)—Six lead motor suitable for part winding start  
• — Not Normally Stocked.  
+ — Item to be discontinued after present stock is depleted

# Century E-plus® III Motors

3/3 Magnetek

## Energy Efficient • Three Phase

Features: Ball Bearings • 60 HZ • 40° C Ambient • Service Factor 1.15 • NEMA Design B • 3 Year Warranty

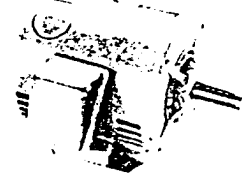
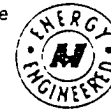
Drip-proof & Totally-Enclosed Fan-Cooled • Rigid Base • 1800 RPM

Applications: Fans, Blowers, Pumps, etc. that require the highest values in Efficiency and Power Factor

3 thru 200 HP

Drip-proof • Class B Insulation

DIMENSION DRAWING ON PAGE 69



HP	RPM	Volts	Frame	Efficiency	Power Factor	Full Load Amps	Shpg. Wt. #	Cat. No.	List Price D-1
3	1800	200	E182T	89.5	85.5	8.5	84	(1) E216	\$ 420.00
		230/460	E182T	89.5	85.5	7.4/3.7	83	(1) E217	420.00
5	1800	200	E184T	89.5	88.0	13.6	93	(1) E218	483.00
		230/460	E184T	89.5	88.0	11.8/5.9	92	(1) E219	483.00
7½	1800	200	D213T	91.7	82.0	21.4	141	(1) E316	654.00
		230/460	D213T	91.7	82.0	18.6/9.3	135	(1) E317	654.00
10	1800	200	D215T	91.0	85.0	27.8	155	(1) E318	727.00
		230/460	D215T	91.0	85.0	24.2/12.1	155	(1) E319	727.00
15	1800	200	G254T	91.7	86.0	41.0	209	(1)(2) E450	1162.00
		230/460	G254T	91.7	86.0	36.0/18.0	217	(1) E451	1162.00
20	1800	200	G256T	92.4	87.0	55.0	232	(1)(2) E452	1318.00
		230/460	G256T	92.4	87.0	48.0/24.0	245	(1) E453	1318.00
25	1800	200	284T	93.6	87.5	65.8	310	(1)(2) E513	1647.00
		230/460	284T	93.6	87.5	57.2/28.6	309	(1) E514	1647.00
30	1800	200	286T	94.1	88.5	77.5	373	(4) E515	1934.00
		230/460	286T	94.1	88.5	67.4/33.7	355	E516	1934.00
40	1800	200	E324T	94.5	89.0	102.4	410	(1)(2) E624	2543.00
		230/460	E324T	94.5	89.0	89.0/44.5	409	(1) E625	2543.00
50	1800	200	S326T	94.5	88.5	130.0	414	(2) E626	2966.00
		230/460	S326T	94.5	88.5	112.0/56.0	411	E627	2966.00
60	1800	460	Y364T	95.4	87.0	67.0	550	(1)(2) E716	3720.00
75	1800	460	Y365T	95.4	87.0	84.6	838	(1)(2) E717	4431.00
100	1800	460	Y404T	95.4	87.0	114.0	1019	(2) E751	5901.00
125	1800	460	D405T	95.4	88.0	139.0	1105	(2) E752	7004.00
150	1800	460	444T	95.8	85.5	171.5	1306	•(2) E846	9232.00
200	1800	460	445T	96.2	86.0	226.0	1433	•(2) E847	11470.00

## Totally-Enclosed Fan-Cooled • Class F Insulation

HP	RPM	Volts	Frame	Efficiency	Power Factor	Full Load Amps	Shpg. Wt. #	Cat. No.	List Price D-1
3	1800	200	182T	88.5	85.5	9.0	91	• E252	\$ 477.00
		230/460	182T	88.5	85.5	7.8/3.9	89	E253	477.00
		575	182T	88.5	85.5	3.1	92	E254	477.00
5	1800	200	184T	89.5	88.0	13.8	99	• E255	550.00
		230/460	184T	89.5	88.0	12.0/6.0	107	E256	550.00
		575	184T	89.5	88.0	4.8	109	E257	550.00
7½	1800	200	213T	91.0	84.5	21.6	183	• E350	748.00
		230/460	213T	91.0	84.5	18.8/9.4	153	E351	748.00
		575	213T	91.0	84.5	7.5	168	E352	748.00
10	1800	200	215T	91.0	85.0	27.8	180	• E353	841.00
		230/460	215T	91.0	85.0	24.8/12.4	189	E354	841.00
		575	215T	91.0	85.0	9.7	188	E355	841.00
15	1800	200	254T	91.7	86.0	41.0	281	•(1)(2) E460	1284.00
		230/460	254T	91.7	86.0	36.0/18.0	280	(1) E461	1284.00
		575	254T	91.7	86.0	14.5	264	(1) E462	1284.00
20	1800	200	256T	93.0	86.5	53.8	320	•(1)(2) E463	1455.00
		230/460	256T	93.0	86.5	46.8/23.4	305	(1) E464	1455.00
		575	256T	93.0	86.5	18.7	251	(1) E465	1455.00
25	1800	200	284T	93.0	88.0	65.5	358	•(1)(2) E549	1905.00
		230/460	284T	93.0	88.0	57.0/28.5	366	(1) E550	1905.00
		575	284T	93.0	88.0	22.8	366	(1) E551	1905.00
30	1800	200	286T	93.6	89.0	74.0	429	•(2) E556	2262.00
		230/460	286T	93.6	89.0	67.4/33.7	429	E552	2262.00
		575	286T	93.6	89.0	26.9	425	E553	2262.00
40	1800	230/460	324T	94.1	89.0	89.0/44.5	502	(1) E628	2746.00
		575	324T	94.1	89.0	35.6	509	E629	2746.00
50	1800	230/460	326T	94.1	89.0	112.0/56.0	565	E630	3381.00
		575	326T	94.1	89.0	45.0	552	E631	3381.00
60	1800	460	364T	94.1	89.0	67.0	840	(1)(2) E720	5027.00
		575	364T	94.1	89.0	54.0	850	(1) E721	5027.00
75	1800	460	365T	94.5	90.0	82.5	900	(1)(2) E722	5760.00
		575	365T	94.5	90.0	66.0	875	(1) E723	5760.00
100	1800	460	405T	95.4	86.0	111.0	1391	(2) E753	7951.00
		575	405T	95.4	86.0	91.0	1400	E754	7951.00
125	1800	460	444T	95.4	89.0	139.5	1709	(1)(2) E835	10719.00
		575	444T	95.4	89.0	111.6	1705	(1) E836	10719.00
150	1800	460	445T	95.8	90.0	166.0	1891	(1)(2) E843	11966.00
		575	447T	95.8	90.0	215.5	2155	(1)(2) E845	15689.00

Notes: (1)—NEMA Design A. (2)—Six lead motor suitable for part winding start. • —Not Normally Stocked.

# Century E-plus<sup>®</sup> Motors

**AI** MagneTek

## Energy Efficient • Three Phase

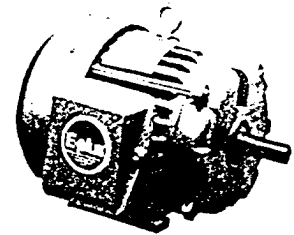
Totally-Enclosed Fan-Cooled • Rigid Base • 3600, 1800 and 1200 RPM



1 thru 150 HP

Features: Ball Bearings • 60 HZ • 40° C Ambient • Class B Insulated • Service Factor 1.15 • NEMA Design B

Applications: Designed for continuous duty, constant torque applications such as fixed-speed fans, blowers, compressors, and conveyor motors that are fully loaded most of the day.



DIMENSION DRAWING ON PAGE 69

HP	RPM	Volts	Frame	Full Load Amps	Efficiency	Power Factor	Sh. Wt. lbs.	Cat. No.	List Price D-1
1	1800	200	L143T	3.1	82.5	84.0	6.0	(1) E123	\$ 342.00
		230/460	L143T	2.7/1.35	82.5	84.0	6.0	(1) E120	342.00
		575	L143T	1.08	82.5	84.0	6.0	(1) E126	342.00
1½	1800	200	M145T	4.5	84.0	85.7	6.3	(1) E124	374.00
		230/460	M145T	3.9/1.95	84.0	85.7	6.3	(1) E121	374.00
		575	M145T	1.56	84.0	85.7	6.3	(1) E127	374.00
2	1800	200	M145T	6.1	84.0	84.1	6.3	(1) E125	408.00
		230/460	M145T	5.3/2.65	84.0	84.1	6.3	(1) E122	408.00
		575	M145T	2.12	84.0	84.1	6.3	(1) E128	408.00
3	1800	200	182T	8.8	86.5	85.5	6.9	(1) E240	482.00
		230/460	S182T	7.8/3.9	86.5	85.5	6.9	(1) E222	443.00
		575	S182T	3.4	86.5	85.5	6.9	(1) E220	443.00
5	1800	200	182T	12.4	86.5	85.5	6.9	(3)(5) E253	477.00
		230/460	213T	10.6/5.3	86.5	85.5	6.9	(3)(5) E342	717.00
		575	213T	4.2	86.5	85.5	6.9	(3)(5) E241	594.00
7½	1800	200	184T	14.7	86.5	88.0	6.9	(1) E223	511.00
		230/460	L184T	12.8/6.4	86.5	88.0	6.9	(1) E221	511.00
		575	L184T	5.1	86.5	88.0	6.9	(1) E256	550.00
10	1800	200	184T	16.8	87.5	88.0	7.0	(3)(5) E343	1001.00
		230/460	215T	14.6/7.3	87.5	88.0	7.0	(3)(5) E336	778.00
		575	215T	5.8	87.5	88.0	7.0	(3)(5) E322	696.00
15	1800	200	213T	18.9	88.5	85.3	7.0	(3)(5) E320	696.00
		230/460	F213T	16.6/8.3	88.5	85.3	7.0	(3)(5) E351	748.00
		575	F213T	7.0	88.5	85.3	7.0	(3)(5) E442	1378.00
20	1800	200	213T	22.0	89.5	84.0	7.0	(3)(5) E337	912.00
		230/460	254T	19.1/9.5	89.5	84.0	7.0	(3)(5) E323	782.00
		575	254T	7.6	89.5	84.0	7.0	(3)(5) E321	782.00
25	1800	200	215T	24.2	87.5	88.0	7.0	(3)(5) E354	841.00
		230/460	F215T	21.0/10.5	87.5	88.0	7.0	(3)(5) E443	1697.00
		575	F215T	8.4	87.5	88.0	7.0	(3)(5) E436	1279.00
30	1800	200	215T	25.0	89.5	88.0	7.0	(3)(5) E422	1194.00
		230/460	256T	21.8/10.9	89.5	88.0	7.0	(3)(5) E420	1194.00
		575	256T	8.8	89.5	88.0	7.0	(3)(5) E461	1234.00
40	1800	200	254T	34.8	88.5	91.2	7.2	(3)(4)(5) E535	2325.00
		230/460	G254T	30.7/15.3	88.5	91.2	7.2	(3)(4)(5) E437	1582.00
		575	G254T	12.3	88.5	91.2	7.2	(3)(4)(5) E421	1353.00
50	1800	200	254T	36.0	90.2	86.2	7.2	(3)(4)(5) E464	1455.00
		230/460	S254T	31.7/15.8	90.2	86.2	7.2	(3)(4)(5) E536	2741.00
		575	S254T	12.7	90.2	86.2	7.2	(3)(4)(5) E554	1715.00
60	1800	200	284T	42.8	90.2	85.0	7.2	(3)(4)(5) E550	1905.00
		230/460	256T	38.0/19.0	90.2	85.0	7.2	(3)(4)(5) E614	3181.00
		575	256T	15.4	90.2	85.0	7.2	(3)(4)(5) E555	2039.00
75	1800	200	284T	54.8	91.7	88.0	7.2	(3)(4)(5) E552	2262.00
		230/460	324T	48.0/24.0	91.7	88.0	7.2	(3)(4)(5) E615	3570.00
		575	324T	18.0	91.7	88.0	7.2	(3)(4)(5) E620	2471.00
100	1800	200	324T	69.0	92.4	89.0	7.2	(3)(4)(5) E628	2746.00
		230/460	364T	60.0/30.0	92.4	89.0	7.2	(3)(4)(5) E710	4855.00
		575	364T	24.0	92.4	89.0	7.2	(3)(4)(5) E622	3043.00
125	1800	200	324T	91.0	93.0	89.0	7.2	(3)(4)(5) E630	3381.00
		230/460	404T	80.0/40.0	93.0	89.0	7.2	(3)(4)(5) E711	5620.00
		575	404T	32.0	93.0	89.0	7.2	(3)(4)(5) E720	5027.00
150	1800	200	364T	113.0	93.0	89.0	7.2	(2)(3)(4)(5) E747	6704.00
		230/460	405T	100.0/50.0	93.0	89.0	7.2	(2)(3)(4)(5) E722	5760.00
		575	405T	40.0	93.0	89.0	7.2	(2)(3)(4)(5) E748	7825.00
200	1800	200	405T	111.0	94.5	86.0	7.2	(2)(3)(5) E753	7951.00
		230/460	444T	97.0/48.5	94.5	86.0	7.2	(2)(3)(5) E829	10971.00
		575	444T	38.8	94.5	86.0	7.2	(2)(3)(5) E835	10719.00
250	1800	200	444T	139.5	95.4	89.0	7.2	(2)(3)(4)(5) E830	13090.00
		230/460	445T	120.0/60.0	95.4	89.0	7.2	(2)(3)(4)(5) E843	11956.00
		575	445T	48.0	95.4	89.0	7.2	(2)(3)(4)(5) E844	14418.00

- Notes: (1)—Steel Frame design.  
 (2)—Six lead motor suitable for part winding start.  
 (3)—Class F Insulated—Cast Iron Motors only  
 (4)—NEMA Design A.  
 (5)—E-plus III motors  
 • —Not Normally Stocked.

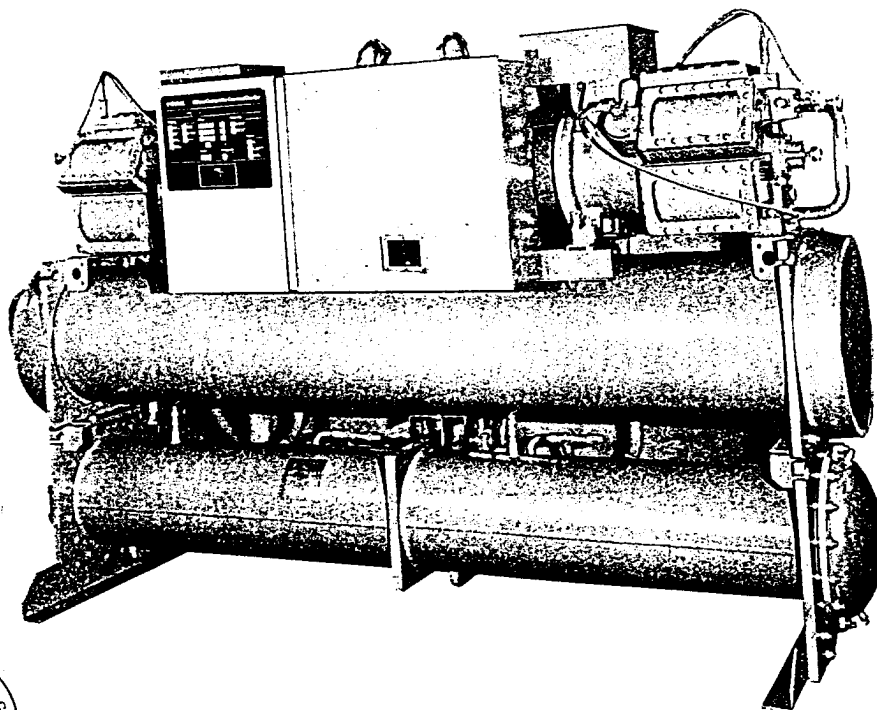


**RecipPak™**

**LIQUID CHILLERS  
WATER COOLED & REMOTE CONDENSER  
MODELS**

R-22

60 TO 250 TONS  
(50 & 60 HZ.)



MODELS YCWZ33AB0—YCWZ99HD0 & YCRZ33A00—YCRZ99H00 (STYLE A)  
MODELS YCWJ45EE0—YCWJ99MJ0 & YCRJ45E00—YCRJ99M00 (STYLE A)

**ENGINEERING GUIDE**



200, 230 & 460-3-60  
Models

# Ratings – Part Load (YCWZ Models)

## WATER COOLED - 60 HZ - STANDARD UNLOADING STEPS

YCWZ33AB0				
% DISPL.	ENT. COND. WATER TEMP. °F	TONS	KW	EER
100.0	85.0	59.1	49.6	14.3
75.0	79.7	46.5	35.5	15.7
50.0	74.1	33.4	22.5	17.8
50.0	73.1	30.8	21.4	17.3
25.0	67.4	17.4	10.2	20.5
IPLV: 16.7 EER				

YCWZ47CC0				
% DISPL.	ENT. COND. WATER TEMP. °F	TONS	KW	EER
100.0	85.0	78.7	66.0	14.3
78.4	80.1	63.5	49.5	15.4
59.5	76.2	51.1	35.9	17.1
56.7	74.2	44.7	33.0	16.3
37.8	70.1	31.9	20.8	18.4
IPLV: 16.3 EER				

YCWZ88CC0				
% DISPL.	ENT. COND. WATER TEMP. °F	TONS	KW	EER
100.0	85.0	98.0	89.8	13.1
83.3	81.7	85.1	72.5	14.1
66.7	78.4	72.3	55.6	15.6
50.0	72.8	50.2	39.8	15.1
33.3	69.5	37.2	24.9	17.9
IPLV: 15.2 EER				

YCWZ89HD0				
% DISPL.	ENT. COND. WATER TEMP. °F	TONS	KW	EER
100.0	85.0	111.1	98.8	13.5
82.0	81.4	95.2	77.9	14.7
66.7	78.1	80.4	60.7	15.9
46.1	72.2	54.4	39.4	16.6
30.7	68.8	39.2	24.6	19.1
IPLV: 15.9 EER				

YCWZ44AB0				
% DISPL.	ENT. COND. WATER TEMP. °F	TONS	KW	EER
100.0	85.0	65.9	56.2	14.1
75.0	79.8	52.1	40.4	15.5
50.0	74.4	37.9	25.6	17.8
50.0	73.0	34.2	24.4	16.8
25.0	67.5	19.7	11.6	20.4
IPLV: 16.4 EER				

YCWZ77CC0				
% DISPL.	ENT. COND. WATER TEMP. °F	TONS	KW	EER
100.0	85.0	85.5	73.8	13.9
83.3	81.5	73.7	59.5	14.9
66.7	78.0	61.7	45.6	16.3
50.0	73.0	44.4	32.1	16.6
33.3	69.4	32.0	20.2	19.0
IPLV: 16.2 EER				

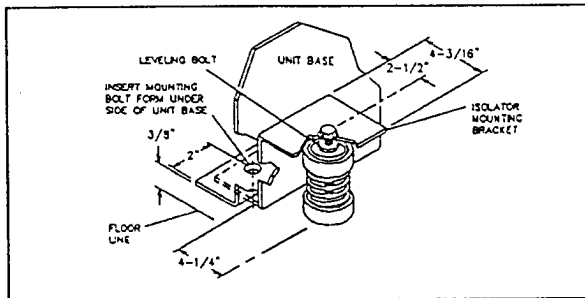
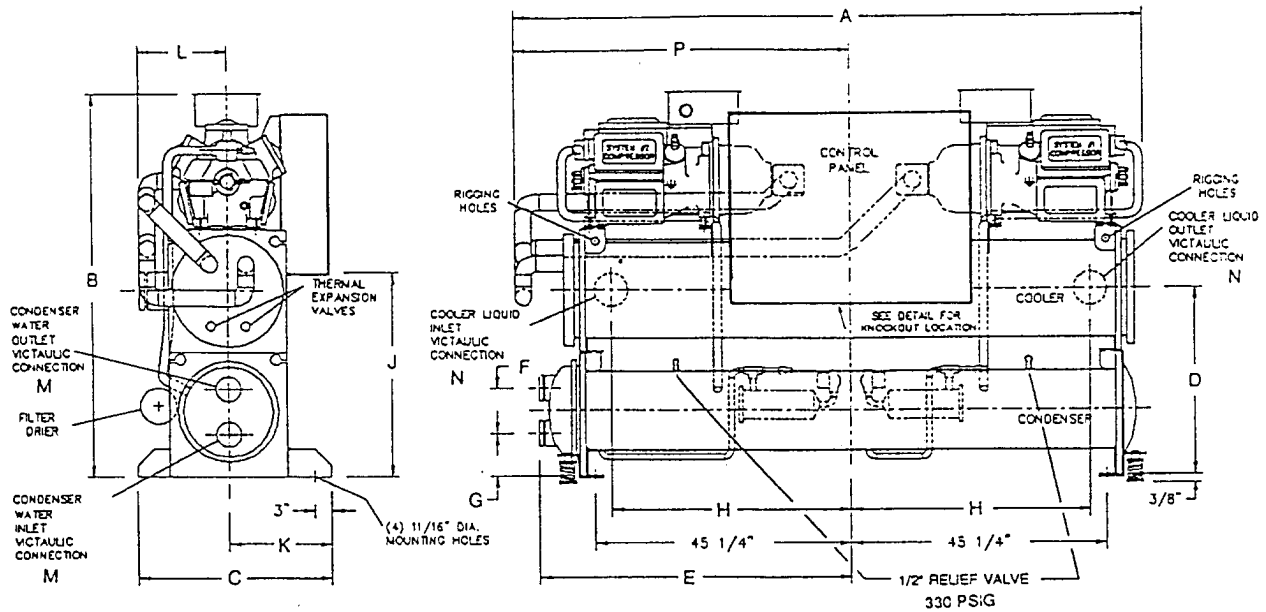
YCWZ88HD0				
% DISPL.	ENT. COND. WATER TEMP. °F	TONS	KW	EER
100.0	85.0	105.3	91.6	13.8
83.3	81.5	90.6	73.6	14.8
66.7	78.0	75.8	56.2	16.2
50.0	73.0	54.7	39.9	16.5
33.3	69.4	39.5	25.0	19.0
IPLV: 16.1 EER				

YCWZ99HD0				
% DISPL.	ENT. COND. WATER TEMP. °F	TONS	KW	EER
100.0	85.0	116.9	106.4	13.2
83.3	81.6	101.0	85.7	14.1
66.7	78.2	85.2	65.4	15.6
50.0	72.9	60.1	47.1	15.3
33.3	69.5	44.2	29.2	18.1
IPLV: 15.3 EER				

SHADED RATINGS CERTIFIED IN ACCORDANCE WITH ARI STANDARD 590-92.

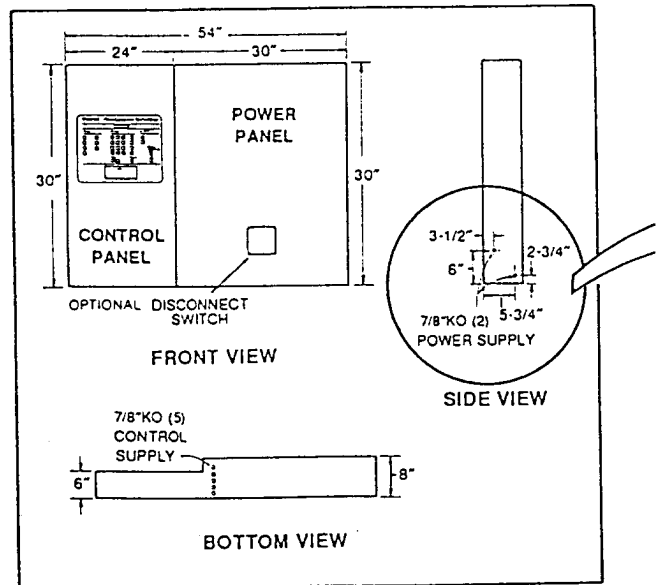
Ratings for optional unloading steps can be obtained from your local York sales representative

# Dimensions (Water Cooled — YCWZ Models)



VIBRATION ISOLATOR MOUNTING DETAILS

- CLEARANCES** — Minimum YORK Required Clearances to Service the Units as Follows:  
 Rear to Wall: 2'0"  
 Front to Wall: 2'6"  
 Top: 2'0"  
 Tube Cleaning & Removal: 8'0" (Either End)
- WEIGHTS (LBS.)** — See Physical Data  
 Total Unit Weight Equally Distributed at 4 Mounting Holes
- Vibration Isolators will Increase Overall Height of Unit by Approximately 3/8".



CONTROL PANEL

MODEL	A	B	C	D	E	F	G	H	J	K	L	M	N	P
YCWZ33AB0	9'-5-3/4"	5'-0-3/8"	2'-11"	2'-3-7/8"	4'-4-13/16"	6'-3/4"	6'-3/4"	3'-7"	2'-2-3/4"	1'-6-1/2"	1'-3-1/2"	4"	4"	5'-1-3/4"
YCWZ44AB0	9'-5-3/4"	5'-0-3/8"	2'-11"	2'-3-7/8"	4'-4-13/16"	6'-3/4"	6'-3/4"	3'-7"	2'-2-3/4"	1'-6-1/2"	1'-3-1/2"	4"	4"	5'-1-3/4"
YCWZ47CC0	9'-6-1/8"	5'-2-3/8"	2'-11"	2'-4"	4'-4-13/16"	6'-3/4"	6'-3/4"	3'-7"	2'-4-7/8"	1'-6-1/2"	1'-3-1/2"	4"	6"	5'-2-3/4"
YCWZ77CC0	9'-6-1/8"	5'-2-3/8"	2'-11"	2'-4"	4'-4-13/16"	6'-3/4"	6'-3/4"	3'-7"	2'-4-7/8"	1'-6-1/2"	1'-3-1/2"	4"	6"	5'-2-3/4"
YCWZ88CC0	9'-6-1/8"	5'-2-3/8"	2'-11"	2'-4-7/8"	4'-4-13/16"	6'-3/4"	6'-3/4"	3'-7"	2'-4-7/8"	1'-6-1/2"	1'-3-1/2"	4"	8"	5'-2-3/4"
YCWZ88HD0	9'-4-1/4"	5'-8-1/8"	2'-11"	2'-9"	4'-7-1/4"	8"	7-3/4"	3'-6-1/2"	2'-10-3/4"	1'-6-1/2"	1'-3-1/2"	4"	8"	5'-2"
YCWZ89HD0	9'-4-1/4"	5'-8-1/8"	2'-11"	2'-9"	4'-7-1/4"	8"	7-3/4"	3'-6-1/2"	2'-10-3/4"	1'-6-1/2"	1'-3-1/2"	4"	8"	5'-2"
YCWZ99HD0	9'-4-1/4"	5'-8-1/8"	2'-11"	2'-9"	4'-7-1/4"	8"	7-3/4"	3'-6-1/2"	2'-10-3/4"	1'-6-1/2"	1'-3-1/2"	4"	8"	5'-2"

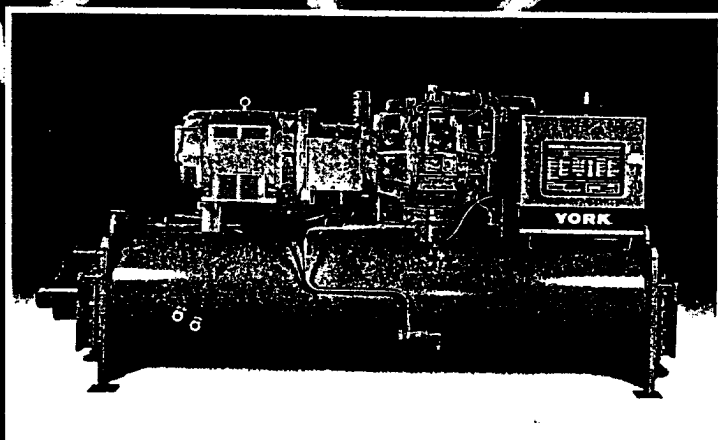
YORK INTERNATIONAL

# **YORK® CodePak™ Rotary Screw Chillers**

125 through 675 tons

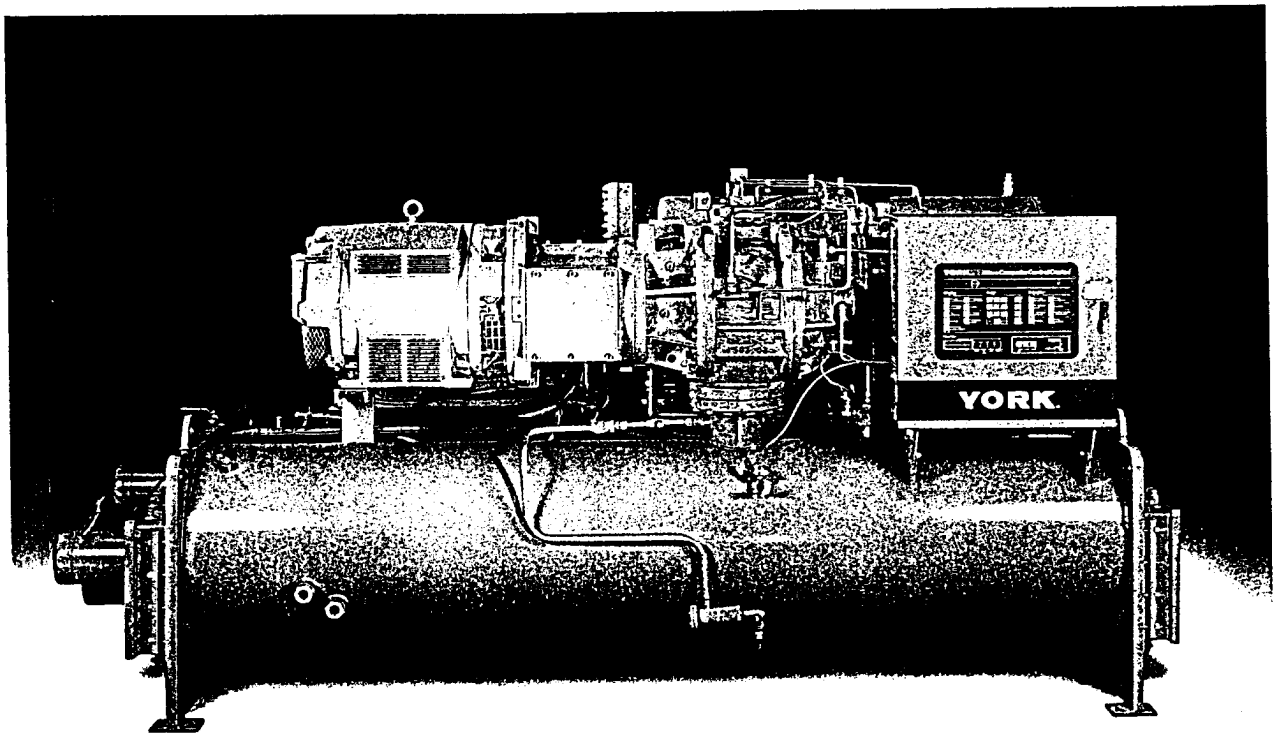


Rated in Accordance with  
ARI Standard 550-90



 **YORK**

# No other screw chiller costs less to install



## Factory packaging reduces field labor costs.

YORK® CodePak™ screw chillers are designed to keep installation costs low. Where installation access is not a problem, the unit can be shipped completely packaged, requiring only three field installation steps:

1. Connect power leads to solid-state starter disconnect switch.
2. Connect chilled and condenser water piping. Victaulic grooves require no on-site welding.
3. Connect chilled water flow switch and pump interlocks to control panel.

That's it. No other screw chiller is quicker, easier, and less expensive to install. Most require addi-

tional field labor to complete the following extra steps:



\*\*YORK CODEPAK SCREW CHILLER SELECTION PROGRAM (AF0101)\*\*  
 ISSUE DATE: 8/95 REV. v1\_04.I.D.D  
 PROJECT - *constant 80°F ECWT* DATE- 02/12/96  
 SALES ENGINEER - PAGE- 1 OF 1  
 CUSTOMER -

PART LOAD PERFORMANCE FOR:

OPEN SCREWPAK MODEL YSCBBBS0-CFB0 REFRIG = 22 HERTZ = 60

COOLING DUTY - CWT IS WATER TEMP ENTERING CONDENSER

PERCENT LOAD	CAPACITY (TONS)	PERCENT POWER	INPUT POWER (KW)	CWT (F)	UNIT PERF (KW/TON)
100	180	100	106	80.0	.589
90	162	92	97	80.0	.599
80	144	80	85	80.0	.590
70	126	71	75	80.0	.595
60	108	61	65	80.0	.602
50	90	49	53	80.0	.589
40	72	45	49	80.0	.681
30	54	40	43	80.0	.796
20	36	35	38	80.0	1.056
10	18	32	35	80.0	1.944

INPUT DATA - (0= NOT SPECIFIED)

CAPACITY (TONS) = 180 MOTOR CODE = CF VOLTS = 460

STARTER TYPE = 1 SSS INRUSH = 555 6 LEAD FLA 149 LRA 1230

STARTER NAME = SOLID STATE STARTER

SSS FLA = 260 SSS LRA = 1556 SSS SIZE = 7L-46

EVAPORATOR - TUBE = 182

PASSES = 2 GPM = 432 FOULING FACTOR = .00025 LEAV TMP(F) = 44.0

CONDENSER - TUBE = 221

PASSES = 2 GPM = 540 FOULING FACTOR = .00025

MAX MOTOR KW = 124

CERTIFIED IN ACCORDANCE WITH ARI STANDARD 550-92

\*\*YORK CODEPAK SCREW CHILLER SELECTION PROGRAM (AF0101)\*\*  
ISSUE DATE: 8/95

REV. v1\_04.I.D.D

PROJECT -  
SALES ENGINEER -  
CUSTOMER -

DATE- 02/12/96  
PAGE- 1 OF 2

TYPE OF SELECTION= UNIT RATING

REFRIGERANT=22

HERTZ= 60

SELECTION NO. 1  
MODEL DESIGNATION YSCBCBS0-CFBO  
CAPACITY (TONS) 177  
INPUT POWER (KW) 112  
UNIT PERF (KW/TON) .630  
FLOW ORIFICE SIZE K  
FLA 158  
LRA 1230  
INRUSH (AMPS) 555  
SSS SIZE 7L-46

85°F ECWT

EVAPORATOR -

PASSES 2  
FOUL FACTOR .00025  
WATER ENT. TEMP (F) 53.82  
WATER LVG. TEMP (F) 44.00  
WATER FLOW (GPM) 432  
WATER VEL. (FPS) 3.9  
WATER PR. DROP (FT) 5.8

CONDENSER -

PASSES 2  
FOUL FACTOR .00025  
WATER ENT. TEMP (F) 85.00  
WATER LVG. TEMP (F) 94.17  
WATER FLOW (GPM) 540  
WATER VEL. (FPS) 4.0  
WATER PR. DROP (FT) 6.1

MAX MOTOR LOAD (KW) 124

CERTIFIED IN ACCORDANCE WITH ARI STANDARD 550-92

INPUT DATA - (0= NOT SPECIFIED)

CAPACITY (TONS) = 180 MOTOR CODE = CF  
VOLTS = 460 STARTER TYPE = ( 1 ) SOLID STATE

EVAPORATOR - TUBE = 182  
PASSES = 2 GPM = 432 FOULING FACTOR = .00025  
CONDENSER - TUBE = 221  
PASSES = 2 GPM = 540 FOULING FACTOR = .00025

\*\*YORK CODEPAK SCREW CHILLER SELECTION PROGRAM (AF0101)\*\*  
 ISSUE DATE: 8/95 REV. v1\_04.I.D.D  
 PROJECT - DATE- 02/12/96  
 SALES ENGINEER - PAGE- 2 OF 2  
 CUSTOMER -

REFRIGERANT=22

MODEL YSCBCBS0-CFBO

# IPLV / APLV CALCULATION

$$\text{IPLV OR APLV} = \frac{1}{\frac{0.17}{A} + \frac{0.39}{B} + \frac{0.33}{C} + \frac{0.11}{D}}$$

WHERE: A = KW/TON AT 100% CAPACITY  
 B = KW/TON AT 75% CAPACITY  
 C = KW/TON AT 50% CAPACITY  
 D = KW/TON AT 25% CAPACITY

% LOAD	CAPACITY (TONS)	ECWT (F)	KW/TON	WEIGHT	WEIGHTED TONS/KW
100	177	85.000	.633	.17	.2687
75	133	78.750	.564	.39	.6916
50	88	72.500	.489	.33	.6753
25	44	66.250	.614	.11	.1793
					1.8149

$$\text{APLV} = \frac{1}{1.8149} = .551$$

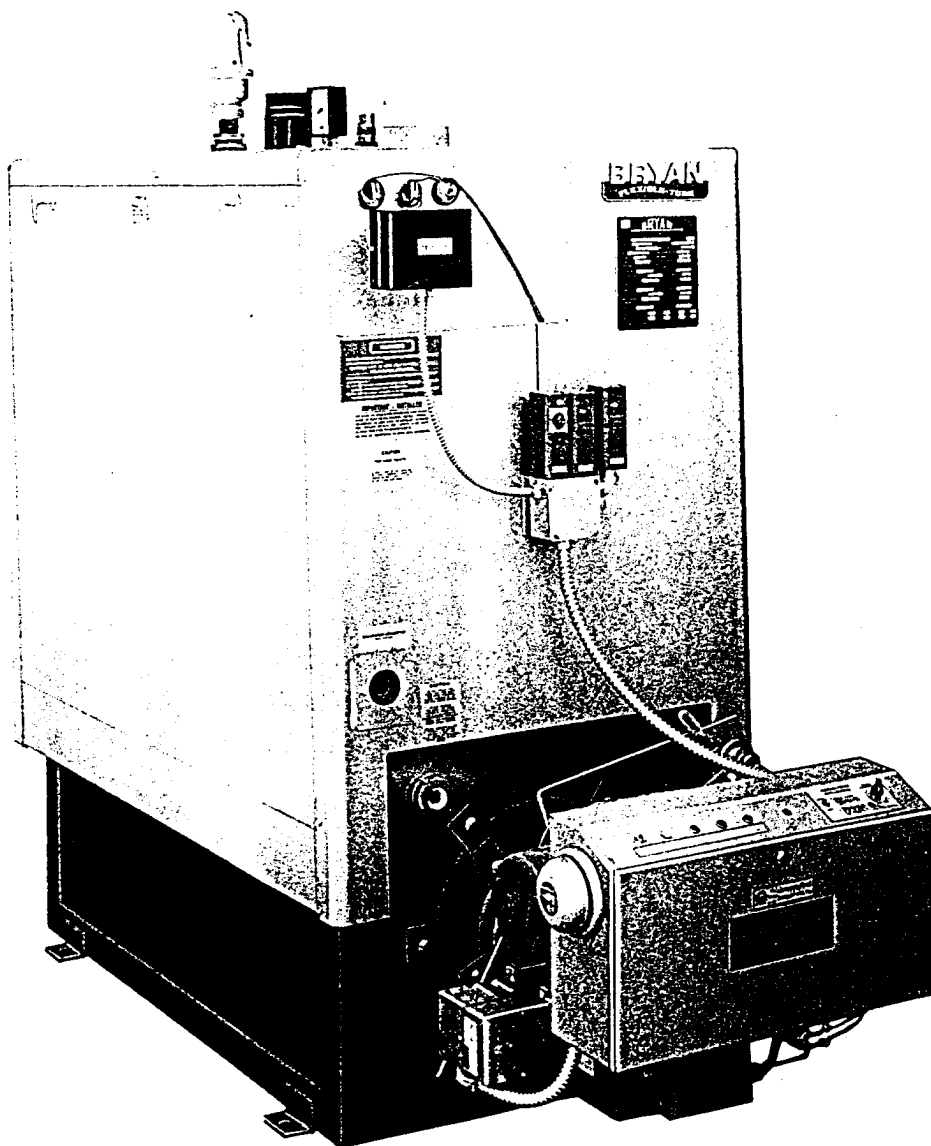
CERTIFIED IN ACCORDANCE WITH ARI STANDARD 550-92

INPUT DATA - (0= NOT SPECIFIED)

CAPACITY (TONS) = 180 MOTOR = CF  
 VOLTAGE = 460 STARTER TYPE = ( 1 ) SOLID STATE STARTER  
 EVAPORATOR -  
 PASSES = 2 LEAV. TEMP (F) = 44.00  
 GPM = 432 FOULING FACTOR = .00025  
 TUBE NO. = 182  
 CONDENSER -  
 PASSES = 2  
 GPM = 540 FOULING FACTOR = .00025  
 TUBE NO. = 221

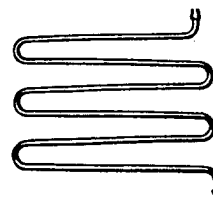
# Forced Draft Gas, Oil or Dual Fuel Fired **Flexible Tube Boilers**

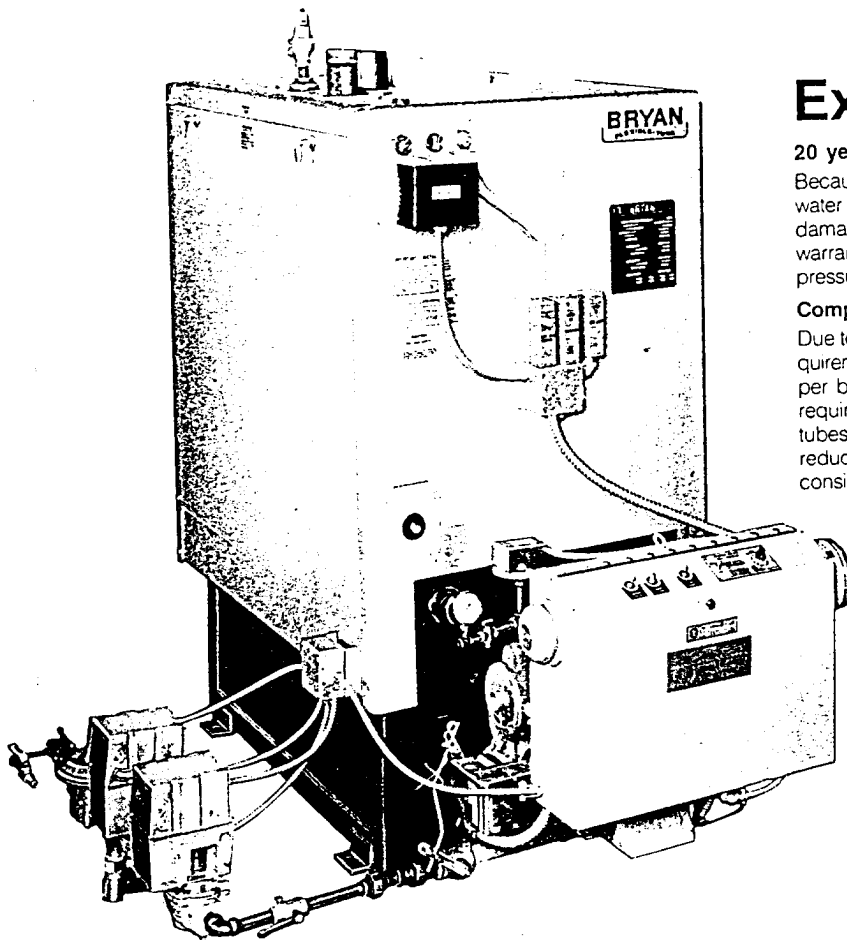
CL Series Hot Water Heating  
750,000 to 3,000,000 BTU's



## **BRYAN BOILERS**

*Featuring the exclusive Bryan "Flexible Water Tube" design*





## Extra Value

### 20 year warranty

Because of the proven effectiveness of the flexible water tube design in eliminating thermal shock damage, every Bryan Flexible Water Tube Boiler is warranted for 20 years, *non-prorated*, against pressure vessel damage due to thermal shock.

### Compact design requires minimum floor space

Due to the flexible water tube design, floor space requirements are minimized, while heating surface area per boiler HP is exceptionally high. The CL Series requires only 24" clearance for servicing the water tubes, only on one side of the boiler. Dramatically reduced space requirements in a boiler room mean considerable savings in building costs.

### Knockdown™ Boilers for Replacement Installations

CL Series Forced Draft Water Boilers are available as knockdown models which are shipped in sections, partially disassembled to pass through standard door size openings, and assembled at final location. There is no need to knock out walls, and assembly does not require expensive certified welding.

## Equipment furnished

### Standard

- Forced draft design
- Combination thermometer and altitude gauge
- A.S.M.E. rated relief valve
- Combustion safety control
- High limit control
- Low water cut-off
- Built-in combustion chamber
- Flange-mounted burner
- Delay oil valve
- Water temperature control (standard is 240°F maximum)
- Heavy gauge jacket with 1½" insulation
- All controls mounted and wired

### Optional

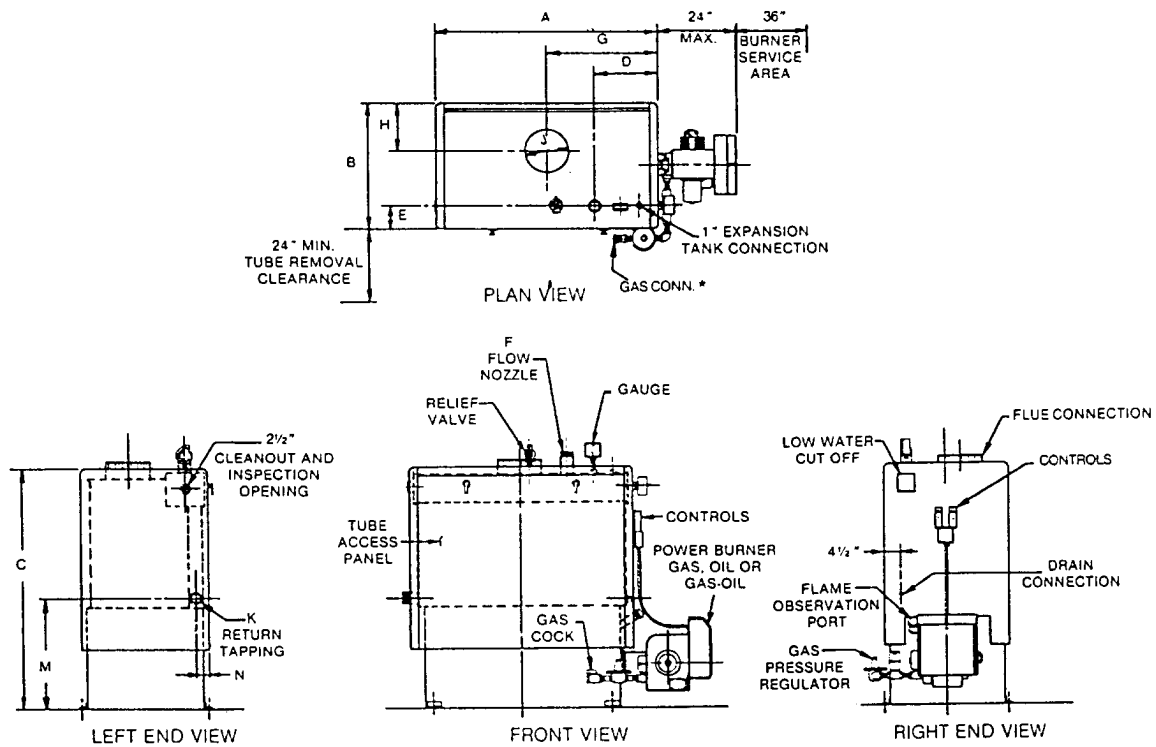
1. Combination water feeder and low water cut-off.
2. Electronic combustion safety control (standard with gas or dual fuel).
3. Induced draft fan.
4. Boiler construction and controls for pressures exceeding 60 psi.
5. Heat exchanger coils for domestic water or other purposes. For storage tank or tankless applications.

## SPECIFICATIONS

Boiler Model Number	Firing Rate		Gross Output		Net Load Recommendation (EDR)		Approximate Shipping Weight
	BTU's per Hour	Oil Gallons per Hour	BTU's per Hour	Boiler Horsepower	BTU's per Hour	Hot Water Radiation Sq. Ft.	
CL-75	750,000	5.3	600,000	18	522,000	3,480	1,830
CL-90	900,000	6.4	720,000	21	626,000	4,180	2,150
CL-120	1,200,000	8.6	960,000	29	835,000	5,560	2,400
CL-150	1,500,000	10.7	1,200,000	36	1,042,000	6,870	2,700
CL-180	1,800,000	12.9	1,440,000	43	1,250,000	8,350	3,000
CL-210	2,100,000	15.0	1,680,000	50	1,460,000	9,750	3,400
CL-240	2,400,000	17.1	1,920,000	57	1,670,000	11,120	3,600
CL-270	2,700,000	19.3	2,160,000	64	1,880,000	12,500	3,900
CL-300	3,000,000	21.4	2,400,000	72	2,087,000	13,920	4,200

NOTE: (1) Boiler construction and controls for pressures exceeding 60 psi. (2) Relief valve opening pressure shall be set at 10% above rated pressure.

# Bryan CL Series Gas, Oil, or Dual Fuel Fired Flexible Tube Boilers



DIMENSIONS (in inches)												
BOILER MODEL	Length Over Jacket	Width Over Jacket	Height Over Jacket	Location of Flow Nozzle or Tapping		Flow Nozzle or Tapping NPT	Location of Flue Connection		Flue Diameter J	Return Tapping NPT	Location of Return Tapping	
	A	B	C	D	E	F	G	H	Forced Draft	K	M	N
CL-75	36¾	34½	66½	17	6¼	3	18⅝	16	8	3	30¼	4½
CL-90	41½	34½	66½	17	6¼	3	20¼	15	10	3	30¼	4½
CL-120	50¾	34½	66½	17	6¼	3	25⅝	14	10	3	30¼	4½
CL-150	59¾	34½	66½	17	6¼	3	29⅝	13	12	3	30¼	4½
CL-180	69	34½	66½	17	6¼	3	34½	12	14	3	30¼	4½
CL-210	78¾	34½	66½	17	6¼	3	39⅝	12	14	3	30¼	4½
CL-240	87½	34½	66½	17	6¼	3	43¾	11	16	3	30¼	4½
CL-270	96¾	34½	66½	17	6¼	3	48⅝	11	16	3	30¼	4½
CL-300	106	34½	66½	17	6¼	3	53	11	16	3	30¼	4½

\*Gas train and control location dimensions will vary depending on job specifications and conditions.

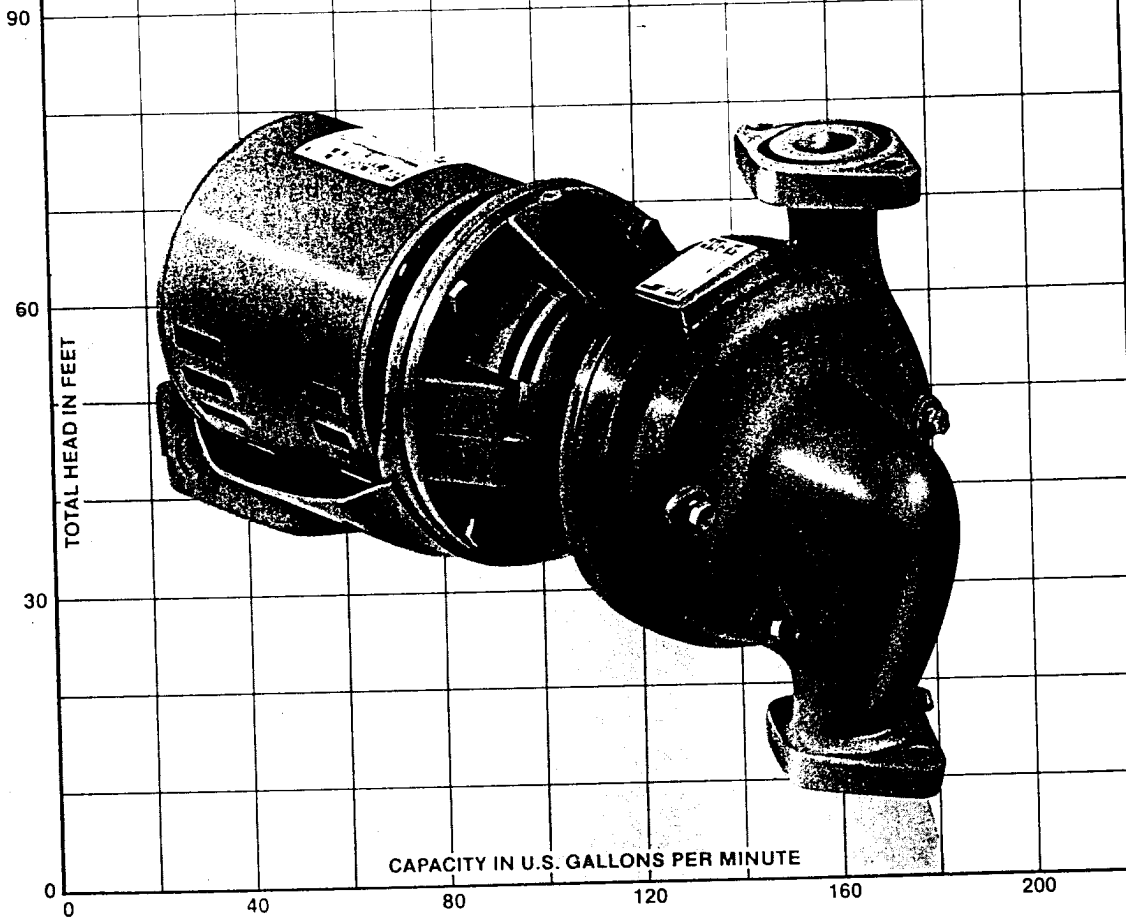
NOTE: Dimensions and specifications are subject to change without notice. Consult factory for certified dimensions.



PO. Box 27, Peru, Indiana 46970 / Telephone: 317-473-6651  
FAX: 317-473-3074

**BELL & GOSSETT**

Bulletin B-105D



**60<sup>®</sup>**  
**SERIES**

## The Extra Quiet In-Line Mounted Pump

### Applications

- Hydronic Heating & Cooling Systems
- Domestic Water
- Fluid Transfer
- Industrial Process

### Advantages

- Compact Design
- Quiet Operation
- Easy Installation
- Easy Maintenance
- Wide Range of Standard Sizes

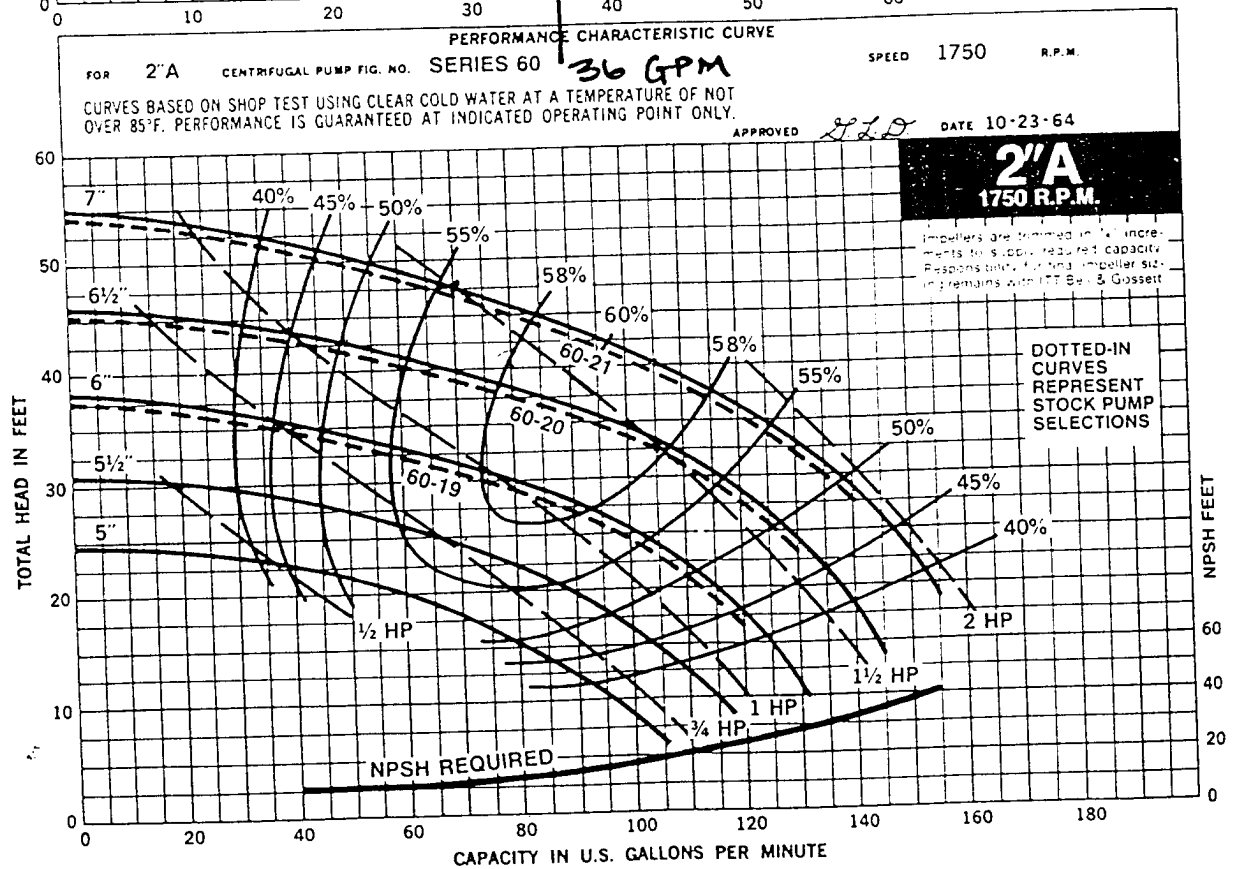
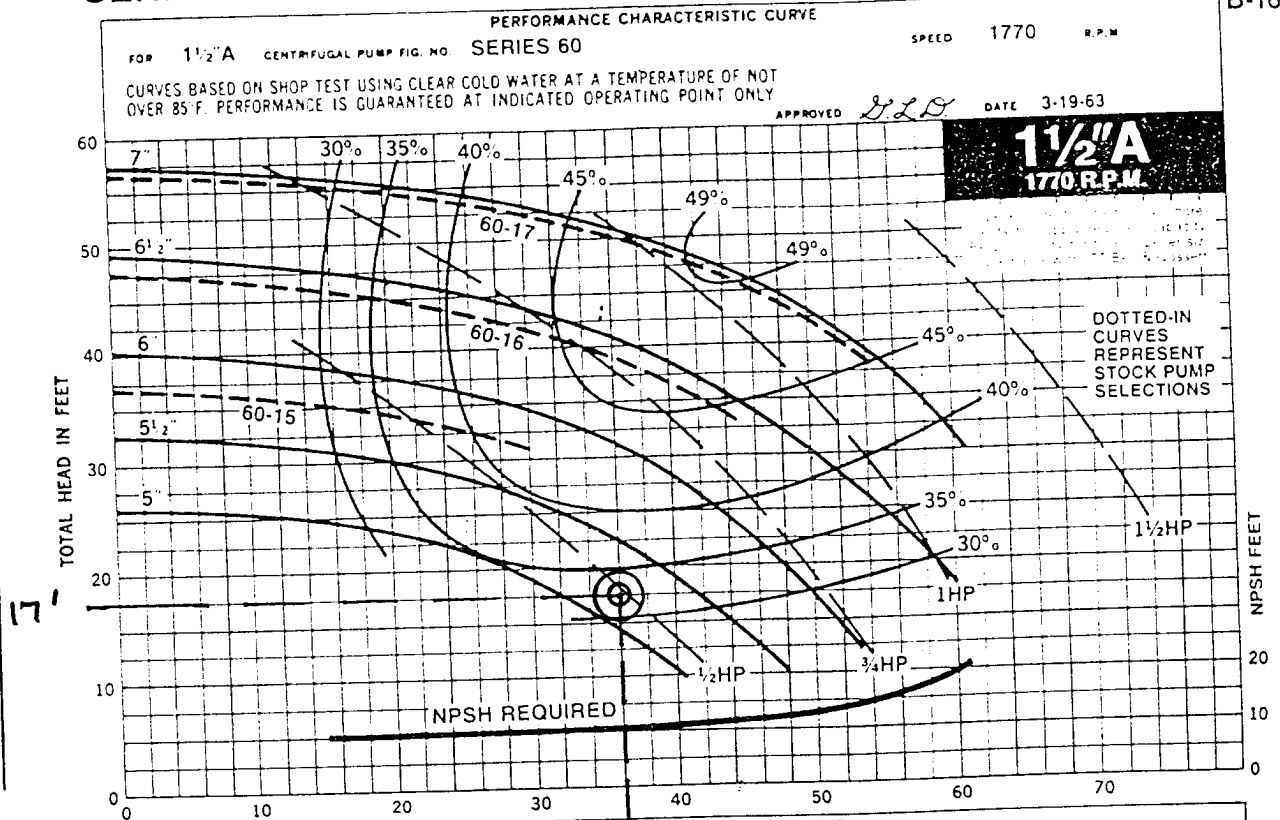


**ITT** **Bell & Gossett**  
ITT Fluid Technology Corporation

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# SERIES 60 BUILT-TO-ORDER PUMP PERFORMANCE CURVES

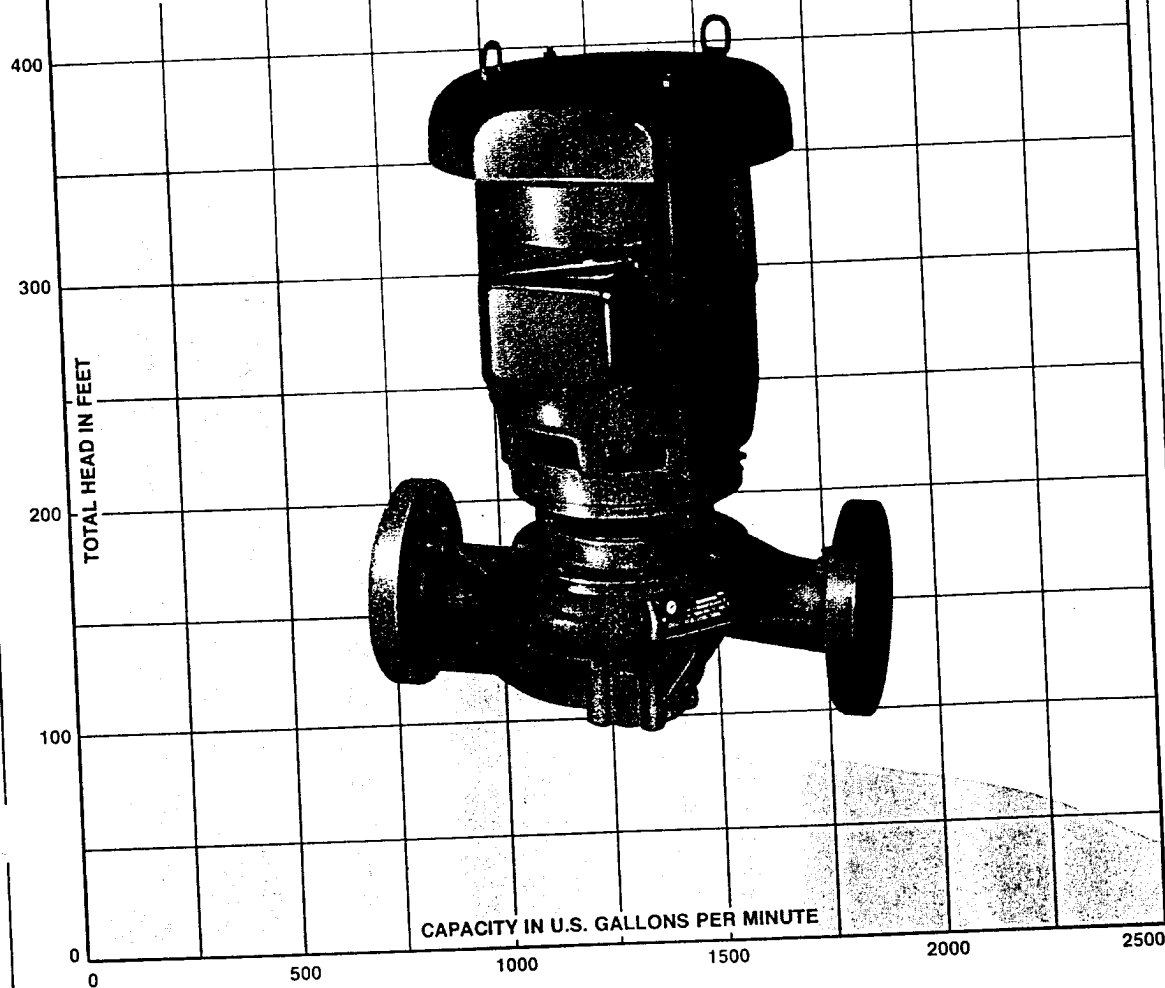
B-160D





**BELL & GOSSETT**

Bulletin B-110B



## In-Line Mounted Centrifugal Pumps

### Applications

- Hydronic Heating & Cooling Systems
- Industrial Process
- General Service
- Pressure Boosting

### Advantages

- Close Coupled
- Space Saving
- Long Life
- Low Maintenance
- Horizontal or Vertical Installation
- Several Seal Options



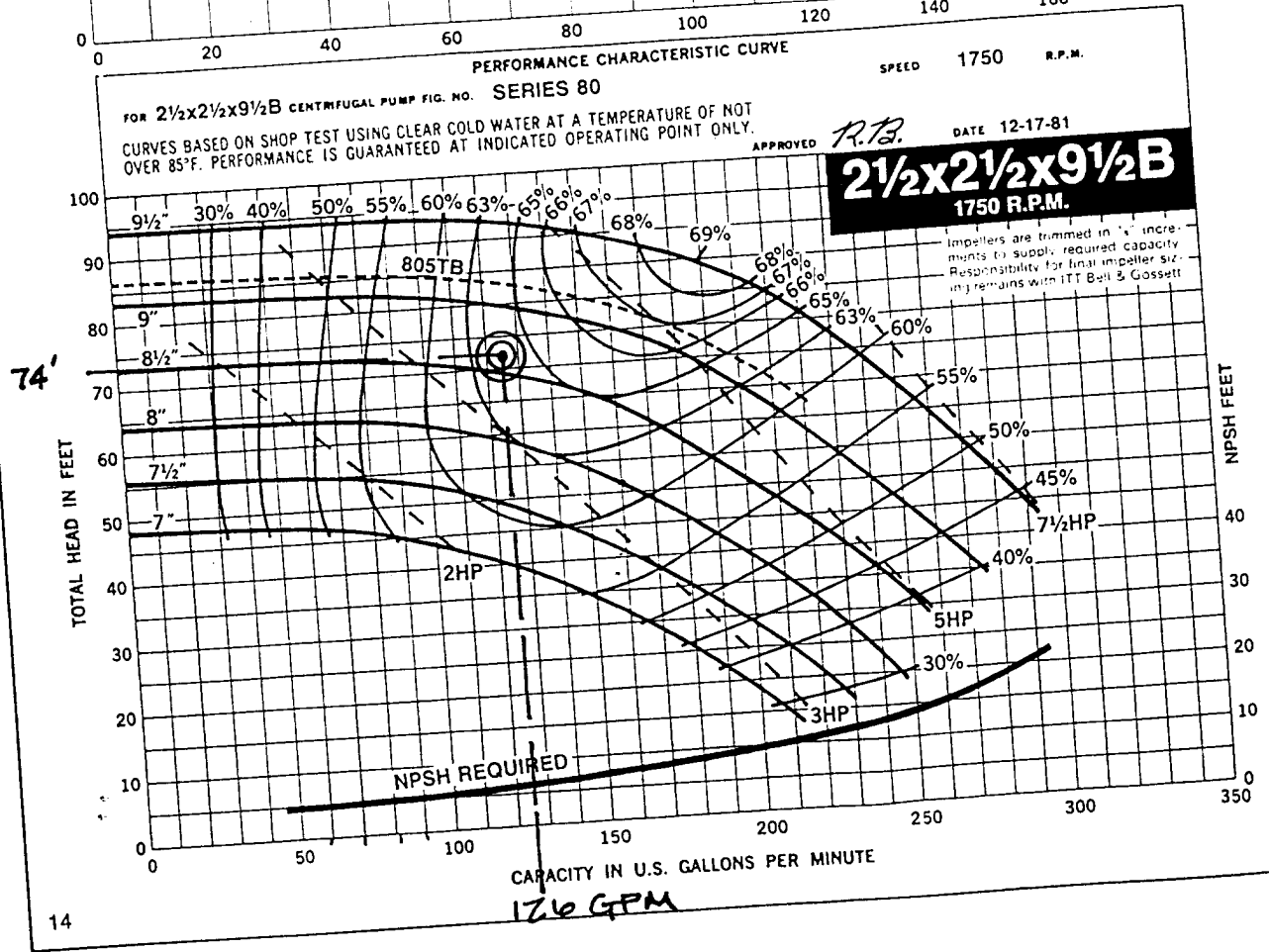
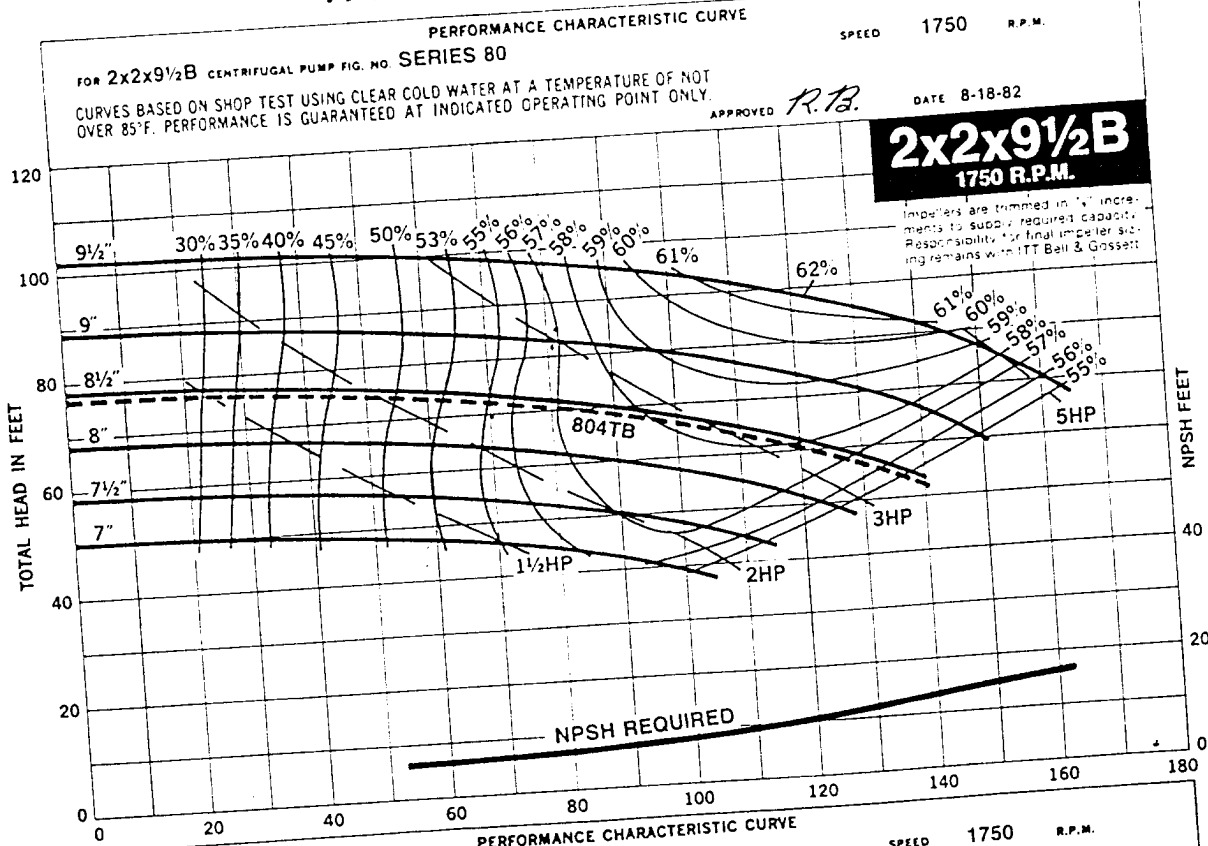
**Bell & Gossett**

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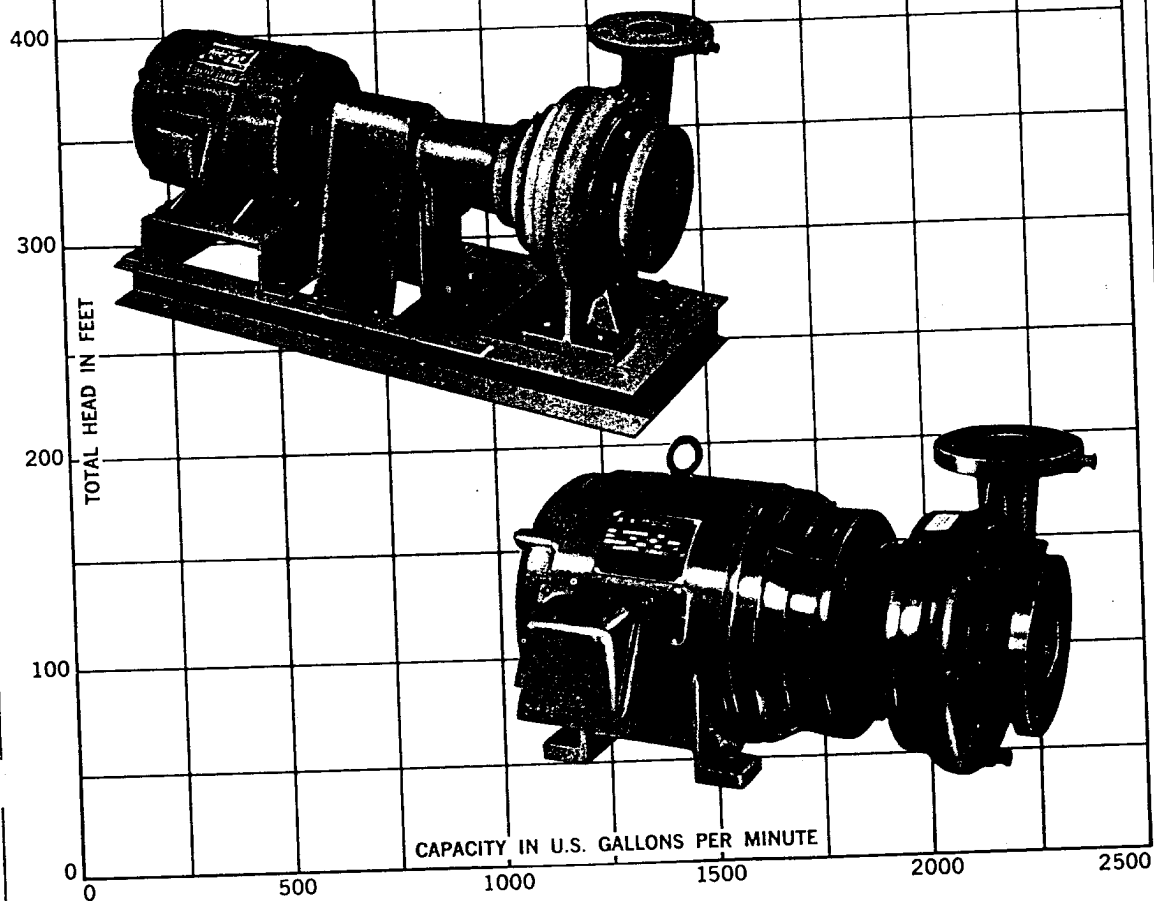
©  
**80  
SERIES**

# 1750 RPM PUMP CURVES



**BELL & GOSSETT**

Bulletin B-207D



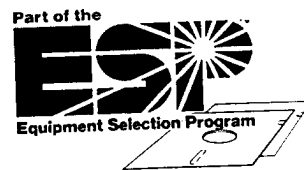
## Centrifugal Pumps

### Applications

- Hydronic Heating & Cooling Systems
- Industrial
- Pressure Boosting
- General Pumping Requirements

### Advantages

- High Efficiency Low Operating Costs
- Modern Designs
- Easy Maintenance
- Several Seal Options
- Broad Range of Application

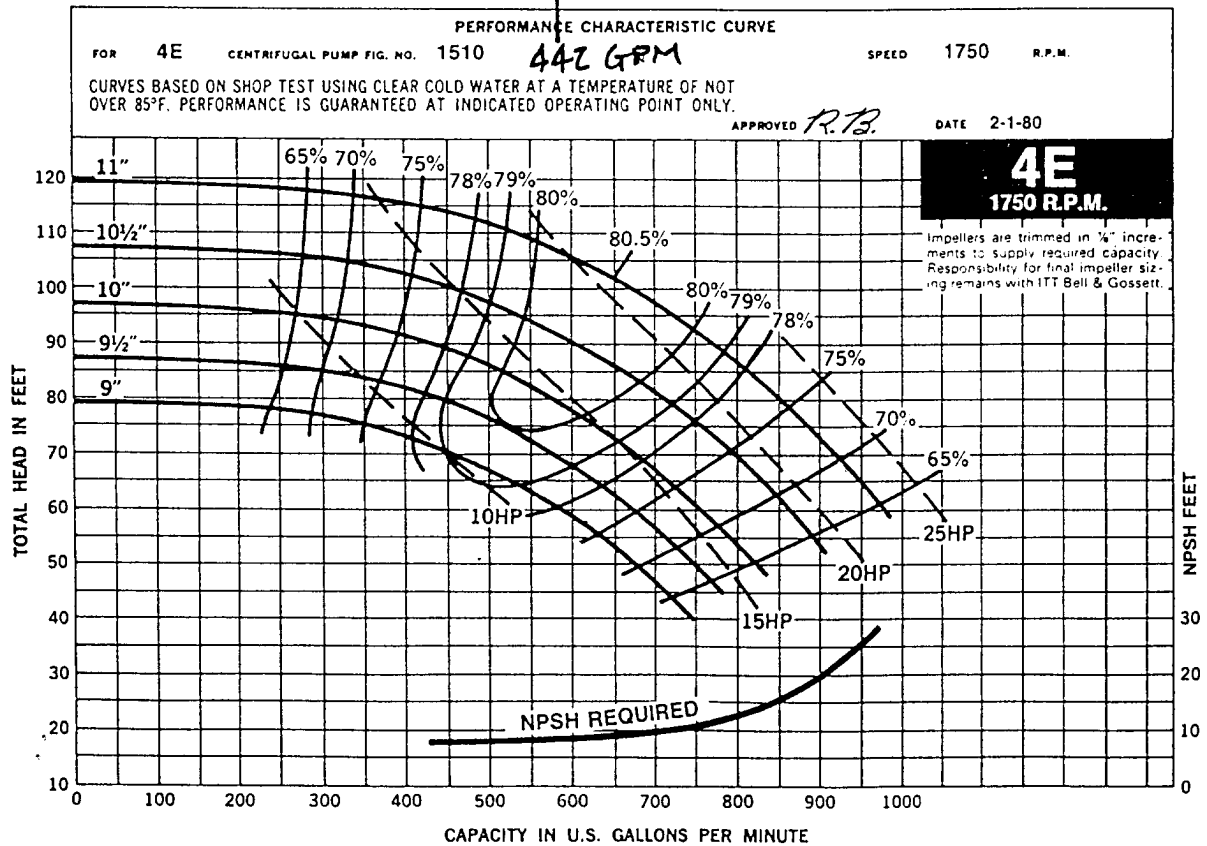
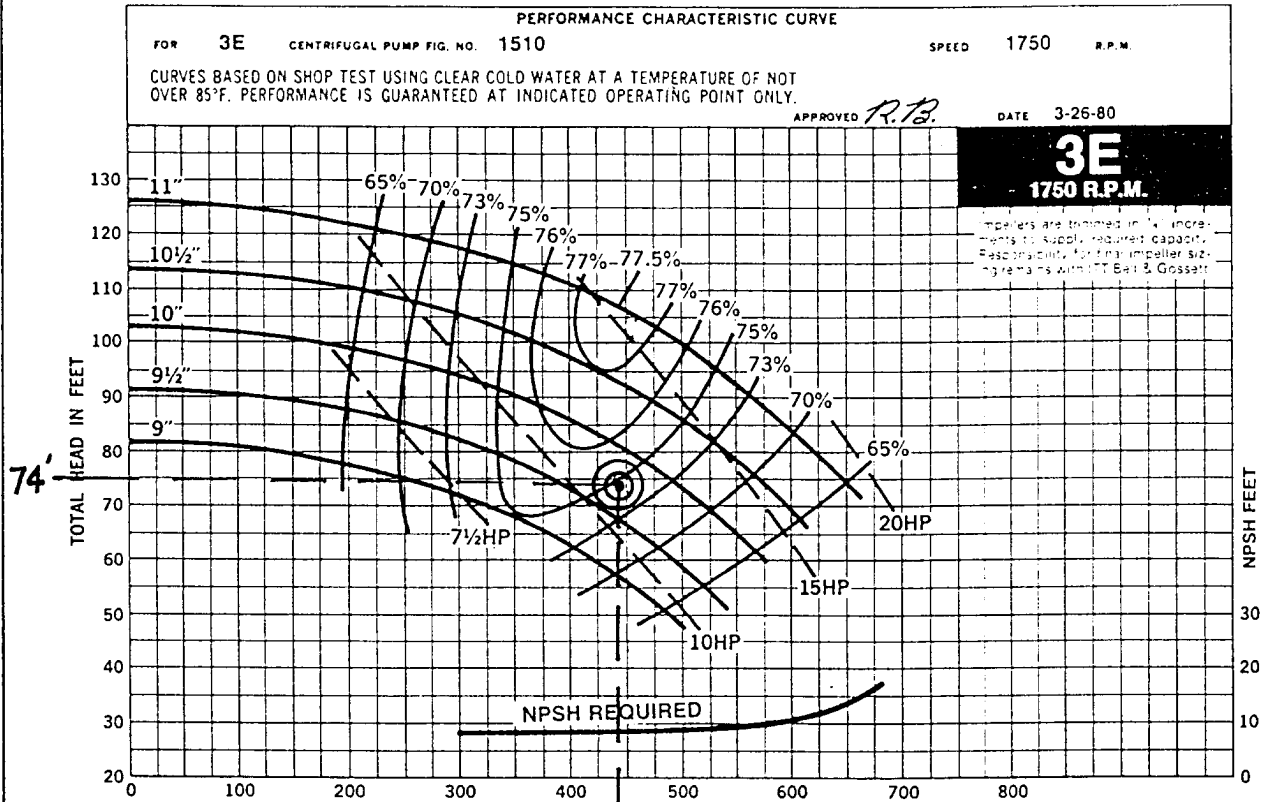


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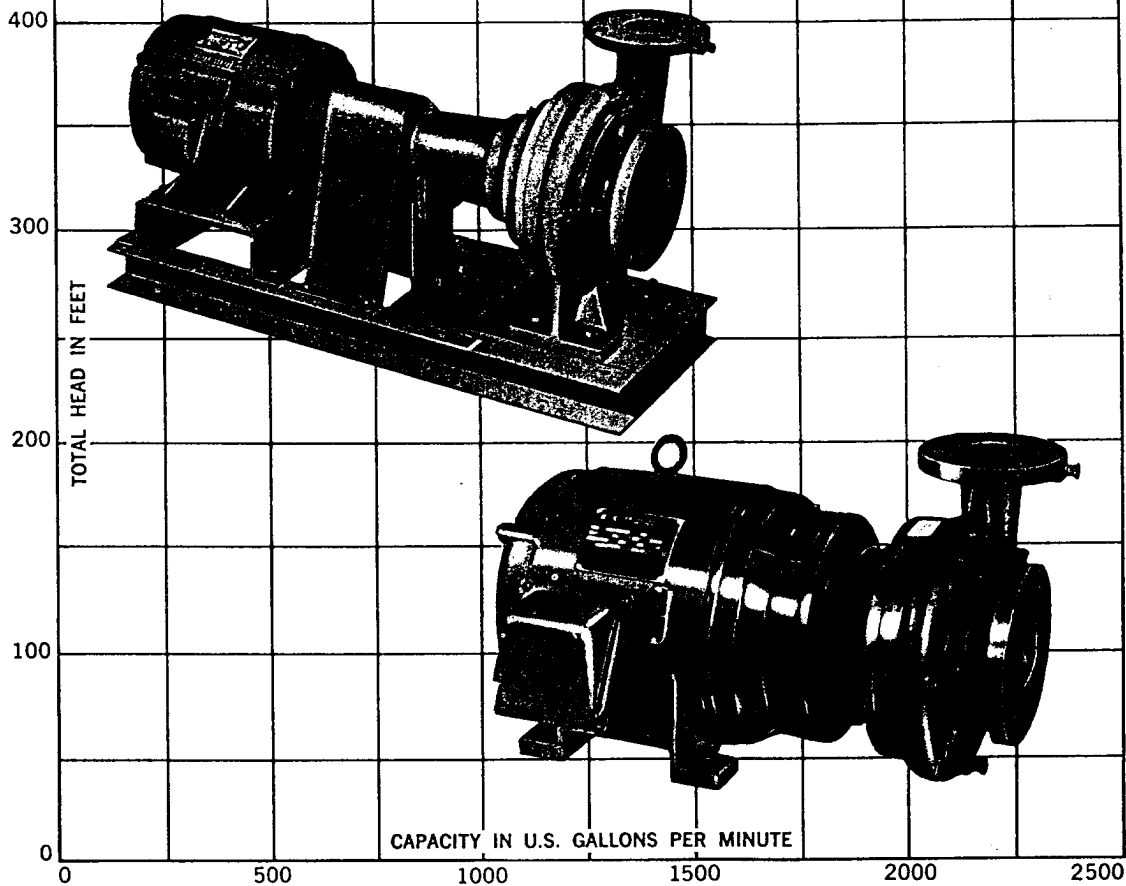
**1510/1531  
SERIES**

# 1750 RPM PUMP CURVES



**BELL & GOSSETT**

Bulletin B-207D



# Centrifugal Pumps

## Applications

- Hydronic Heating & Cooling Systems
- Industrial
- Pressure Boosting
- General Pumping Requirements

## Advantages

- High Efficiency Low Operating Costs
- Modern Designs
- Easy Maintenance
- Several Seal Options
- Broad Range of Application

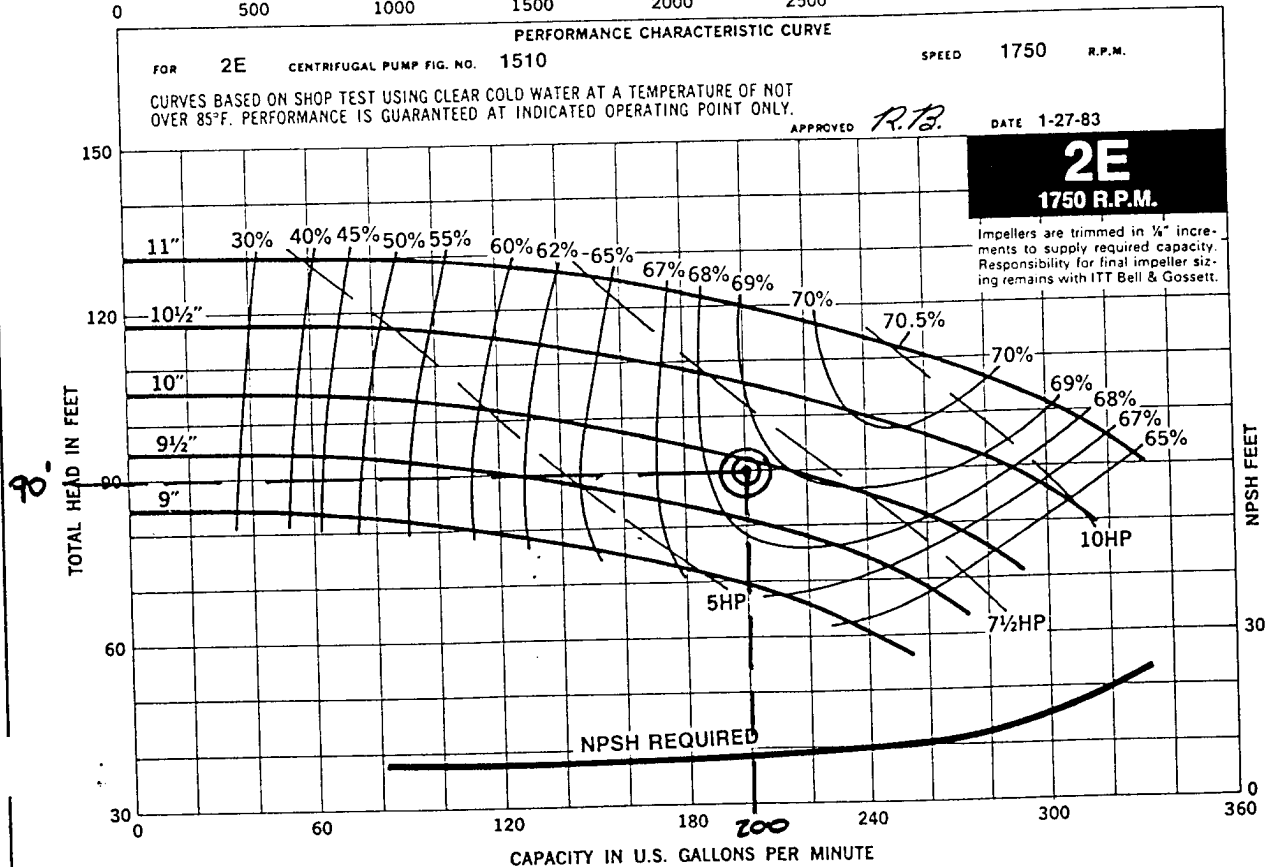
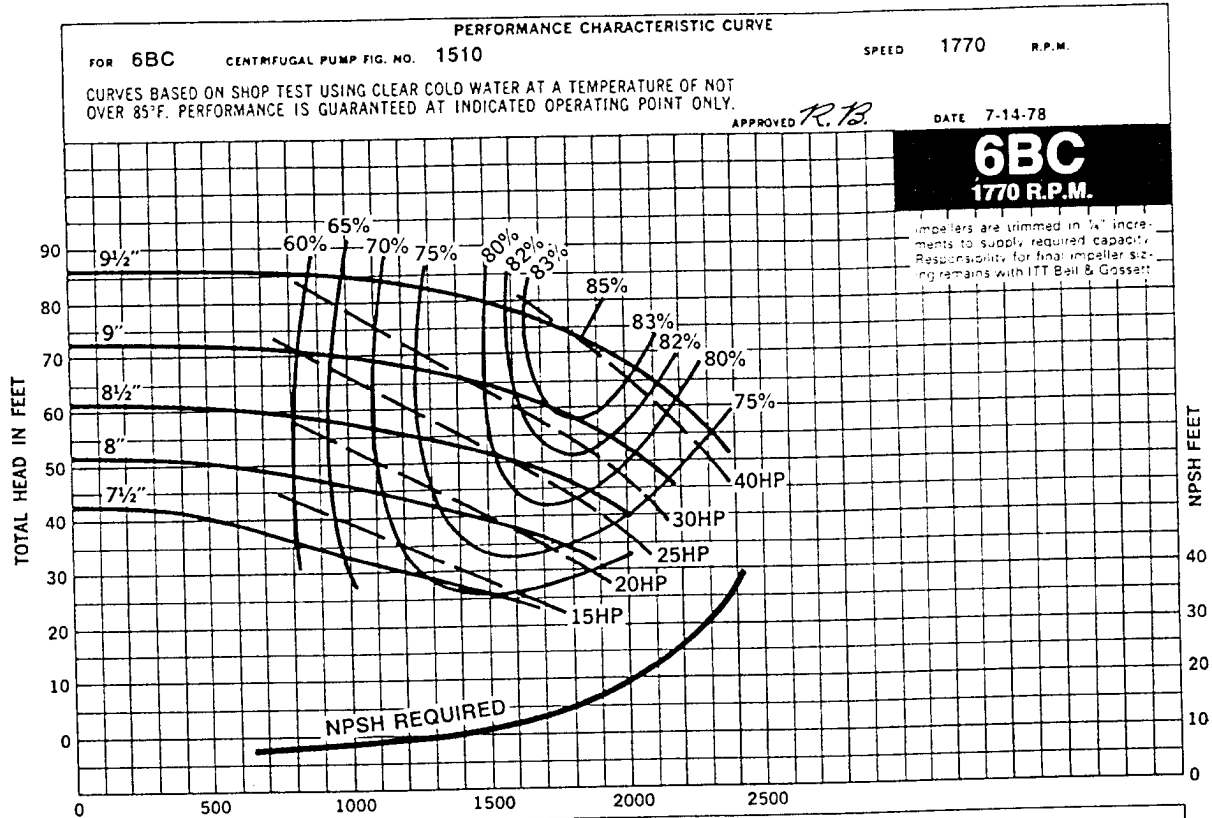


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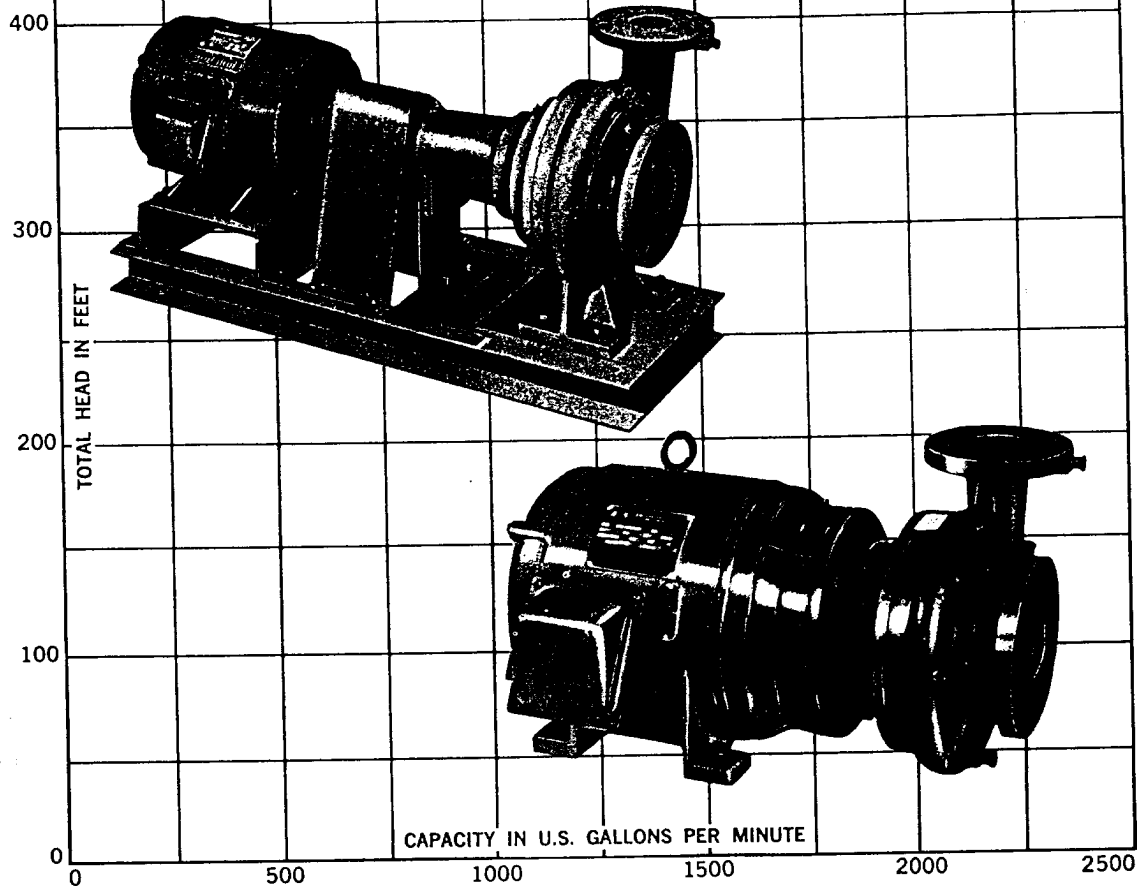
**1510/1531  
SERIES**

## 1750 RPM PUMP CURVES



**BELL & GOSSETT**

Bulletin B-207D



## Centrifugal Pumps

### Applications

- Hydronic Heating & Cooling Systems
- Industrial
- Pressure Boosting
- General Pumping Requirements

### Advantages

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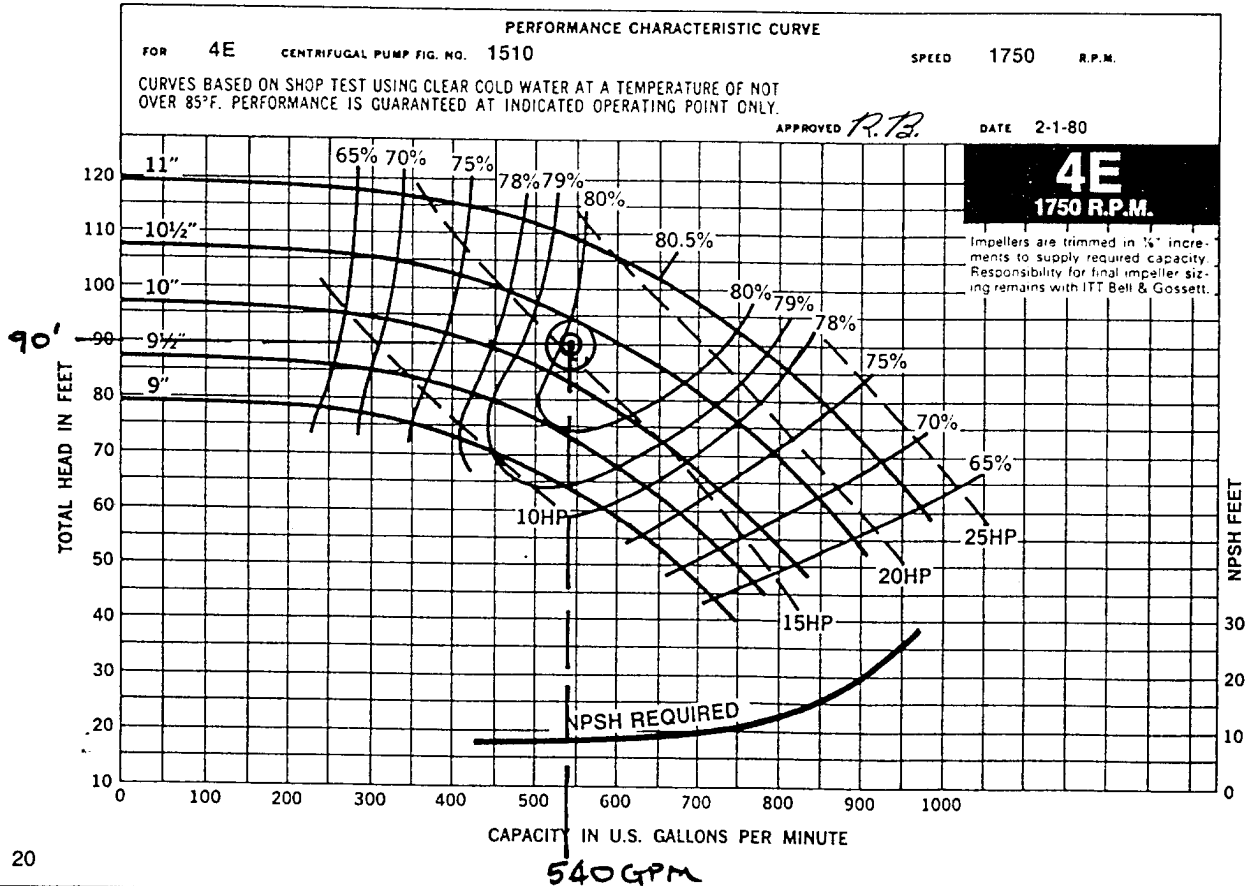
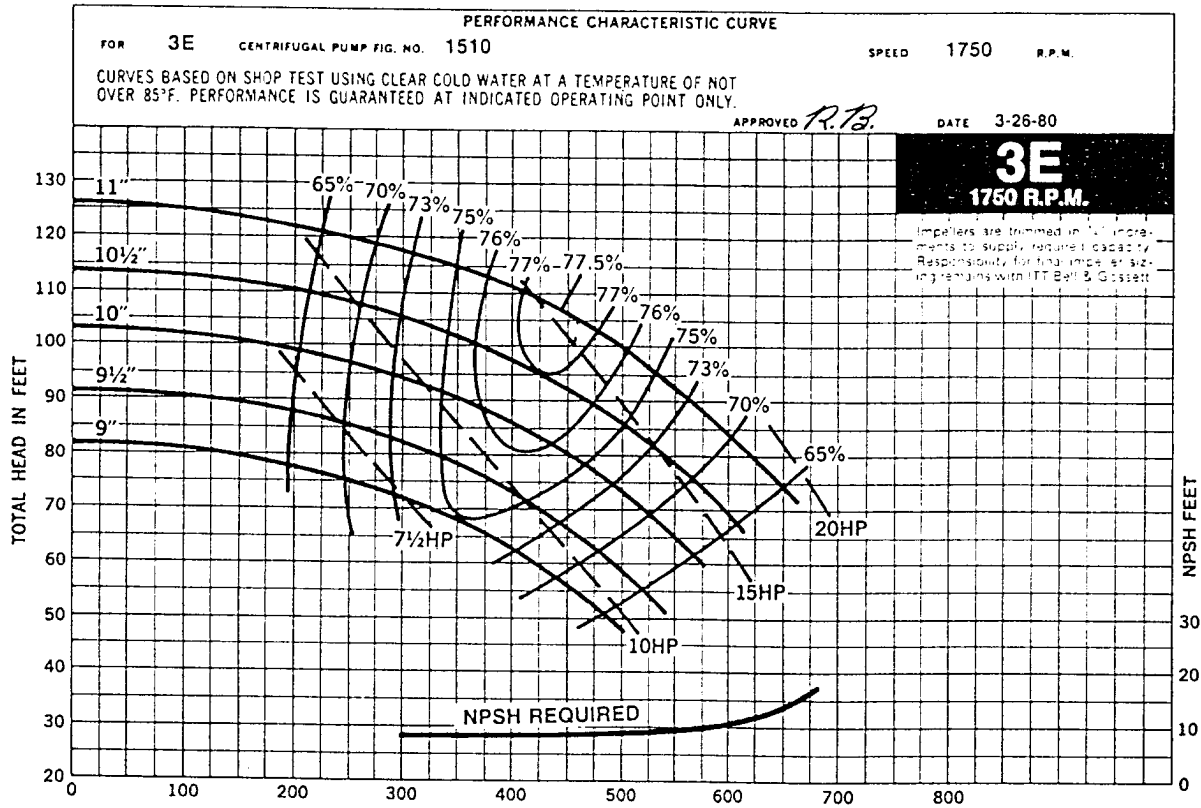


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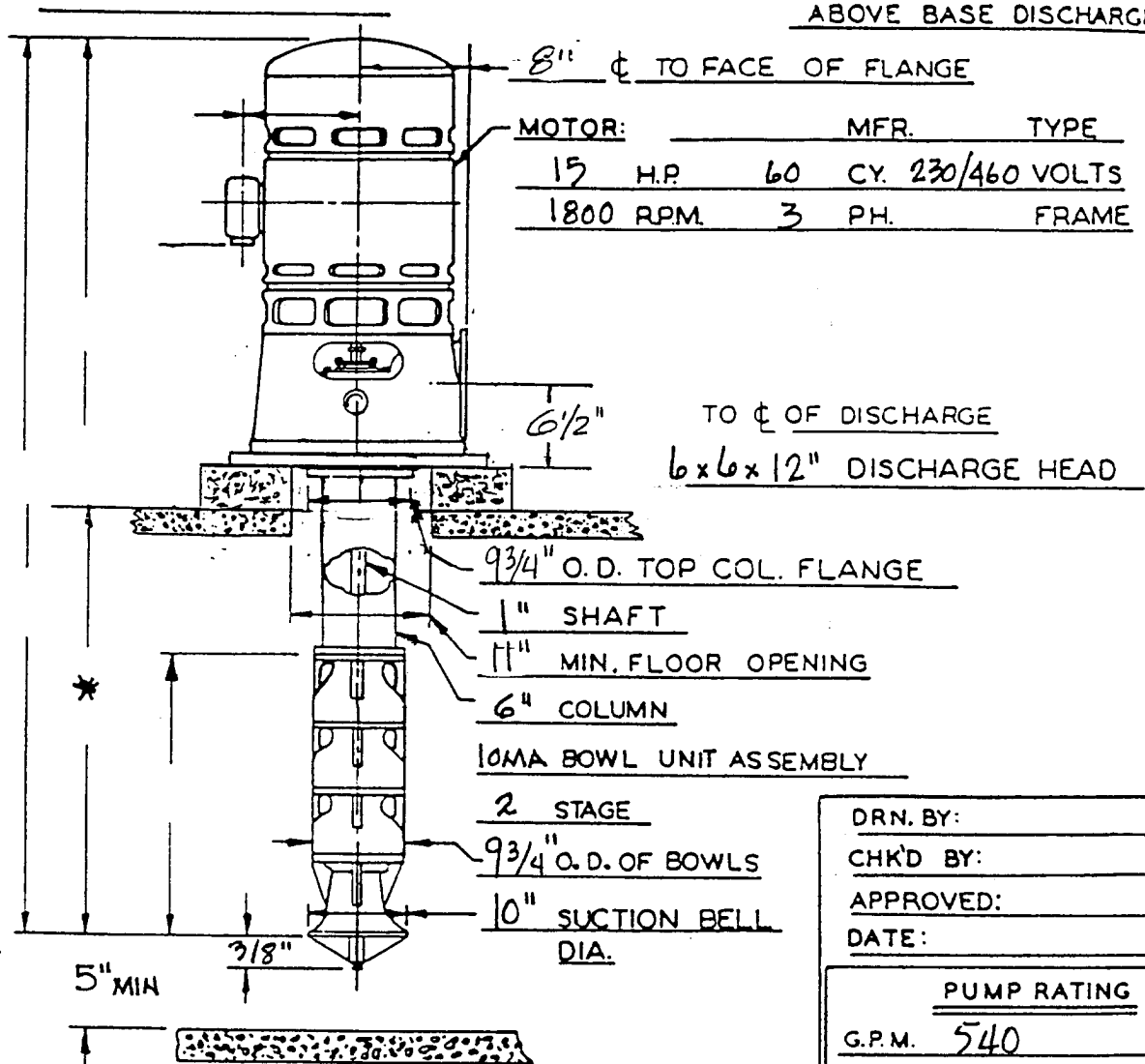
**SERIES 1510/1531**

# 1750 RPM PUMP CURVES

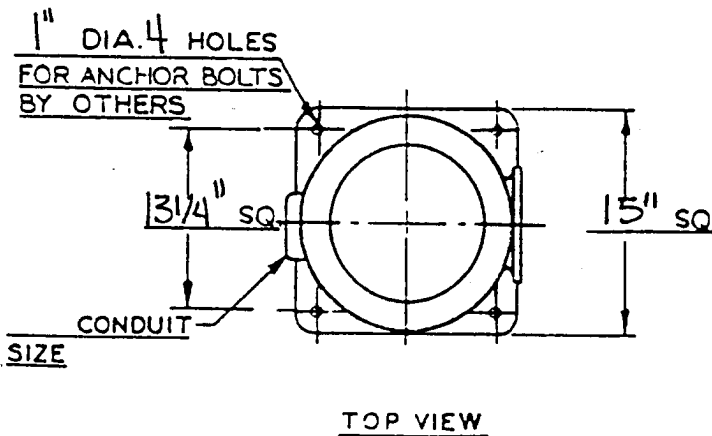




CLOSE COUPLED  
ABOVE BASE DISCHARGE



\* BASED ON PIT DEPTH.



DRN. BY: \_\_\_\_\_

CHK'D BY: \_\_\_\_\_

APPROVED: \_\_\_\_\_

DATE: \_\_\_\_\_

PUMP RATING

G.P.M. 540

F.T. FIELD HD. 75.

SQ. NO. \_\_\_\_\_

SOLD TO: \_\_\_\_\_

ORDER NO. \_\_\_\_\_

USER \_\_\_\_\_

ITEM NO: \_\_\_\_\_

END USE: \_\_\_\_\_

PUMP NO. \_\_\_\_\_

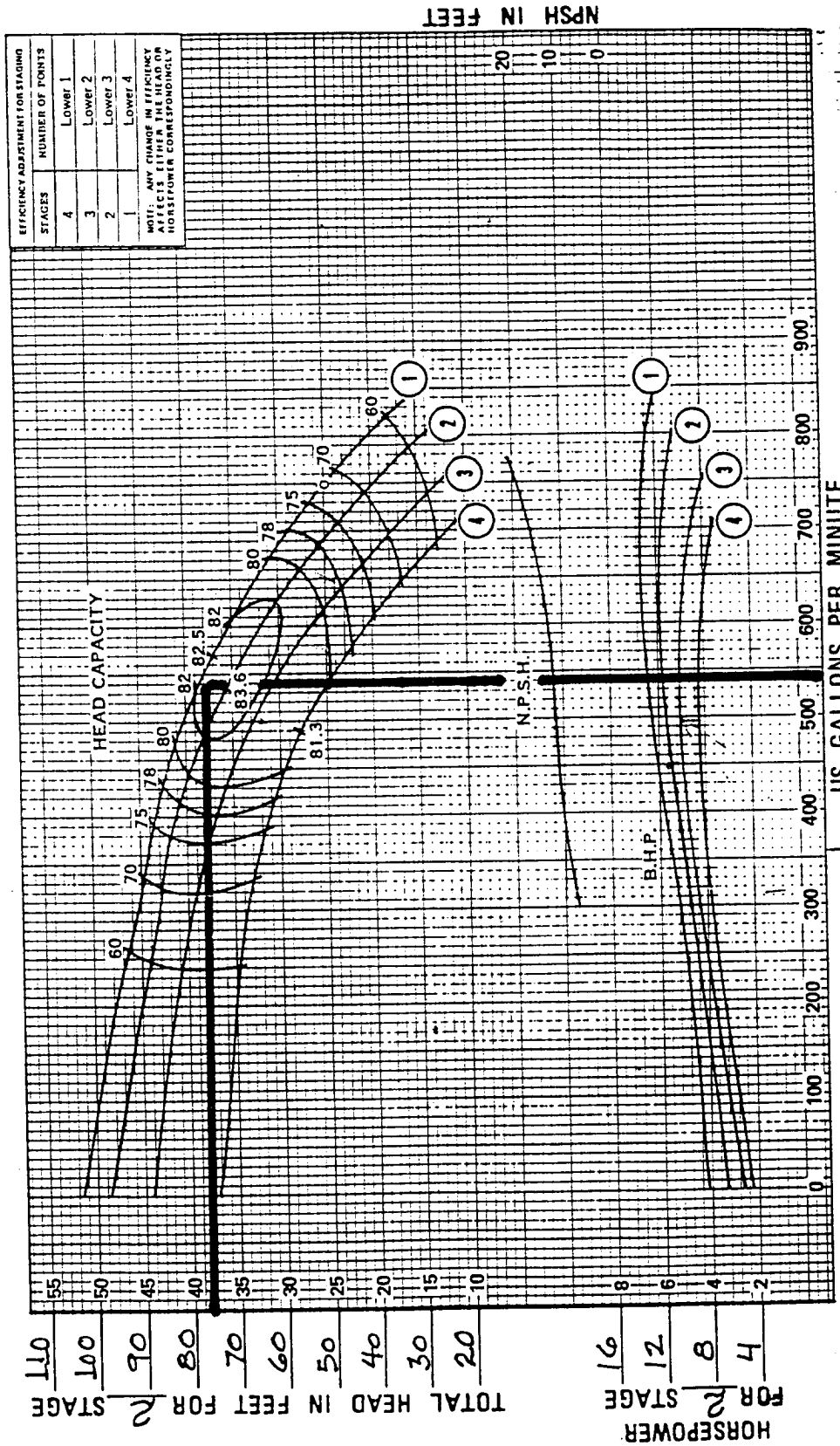
THIS CERTIFIED PRINT

☐ FOR APPROVAL

BY \_\_\_\_\_ DATE \_\_\_\_\_

☐ FOR CONSTRUCTION

BY \_\_\_\_\_ DATE \_\_\_\_\_



Customer		BOWL T-84232-C.I.E.	
Item		CURVE 4806183	
Peerless Ref. No.		RPM 1760	
Laboratory Performance		SIZE 10MA	
TAKEN FROM		26863	
HYDRAULIC PERFORMANCE WARRANTY	CURVE NO.	IMPELLER NO.	IMPELLER DIA.
	1	T84363	UNDERCUT 7-1/8"
	2	T84363	STANDARD FILING 7-1/8"
	3	T84363	7"
Guaranteed at designated point only, and contingent on:		6-5/8"	
Proper flow to pump section			
Proper submergence			
Fluid free of gas, air & abrasives			
Proper lateral setting of impeller			

PUMP DESCRIPTION: Driver 15 HP, 3 PH, 60 HZ, 230/400, 1800; Head 6" CAST IRON; Column 6" x 1" SHAFT

BOWL PERFORMANCE: Capacity 540 gpm; Head 75 ft; Eff 79 %; BHP 12.9

GUARANTEED PERFORMANCE: Capacity 540 gpm; Head 75 ft; Eff 79 %; BHP 12.9

### AERCO KC Gas Fired Hot Water Boiler System

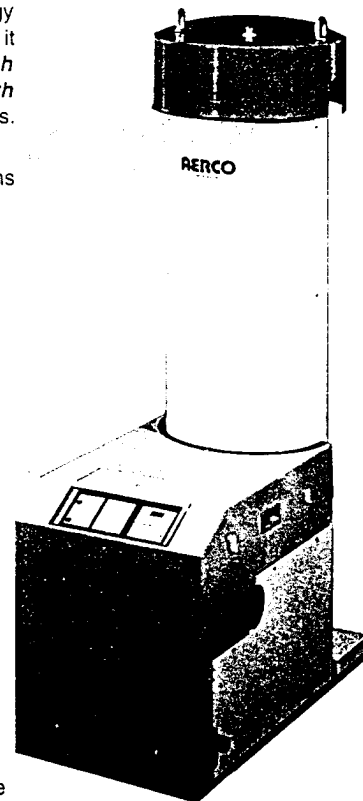
The AERCO KC Water Boiler is a true industry advance that meets the needs of today's energy and environmental concerns. Designed for application in any closed loop hydronic system, it relates energy input directly to fluctuating system load, yielding **seasonal efficiencies as high as 95%**. The boiler can be used singly or in **modular arrangements for inherent standby with minimum space requirements**. Venting flexibility permits installation without normal restrictions.

The advanced electronics of each boiler module offer selectable modes of operation. The options available include:

- Constant Temperature Internal Setpoint
- Indoor/Outdoor Reset
- 4-20ma Linear Signal Response
- AERCO Boiler Management System Integration
- AERCO Combination Domestic Water/Boiler Plant

Regardless of the mode of operation, the load tracking capability of every unit delivers the ultimate in energy control through energy input modulation with a 14:1 ratio while meeting all load demands.

With condensing capability, the KC Boiler is ideally suited for modern low temperature as well as conventional heating systems. Because of the compact design with direct or conventional venting, the KC Boiler system is applicable to either new construction or retrofit application with the same excellent results. Efficiently, reliability, and longevity make the KC Boiler System a true step forward in heating system design.



#### KC1000 FEATURES

- Natural Gas or Propane
- 14:1 Turndown Ratio
- Direct Vent or Conventional Vent Capabilities
- ASME 150 PSIG Working Pressure Certified
- UL, ULC Listed, FM Approved, ASME Coded
- UL, ULC Listed for Alcove Installation on Combustible Flooring
- Quiet Operation throughout Firing Range
- Internal Low Water Cutoff and Dual Over Temperature Protection
- Compact Space Efficient Design
- Precise Temperature Control  $\pm 2^\circ\text{F}$
- Optional Sealed Combustion

#### KC-1000 Specifications

BTU Input .....	1,000,000 BTU/Hr†
Net Output @ full input .....	860,000-915,000 BTU/Hp*
ASME Working Pressure .....	150 PSIG
Electrical Requirement .....	120/1/60 20 Amp
Gas Requirements .....	8.5" W.C. Minimum @ Full Load 14" W.C. Maximum
Vent Size .....	6" Diameter
Water Connections .....	4" Flanged 150 lb. ANSI
Gas Connection .....	1-1/4" NPT

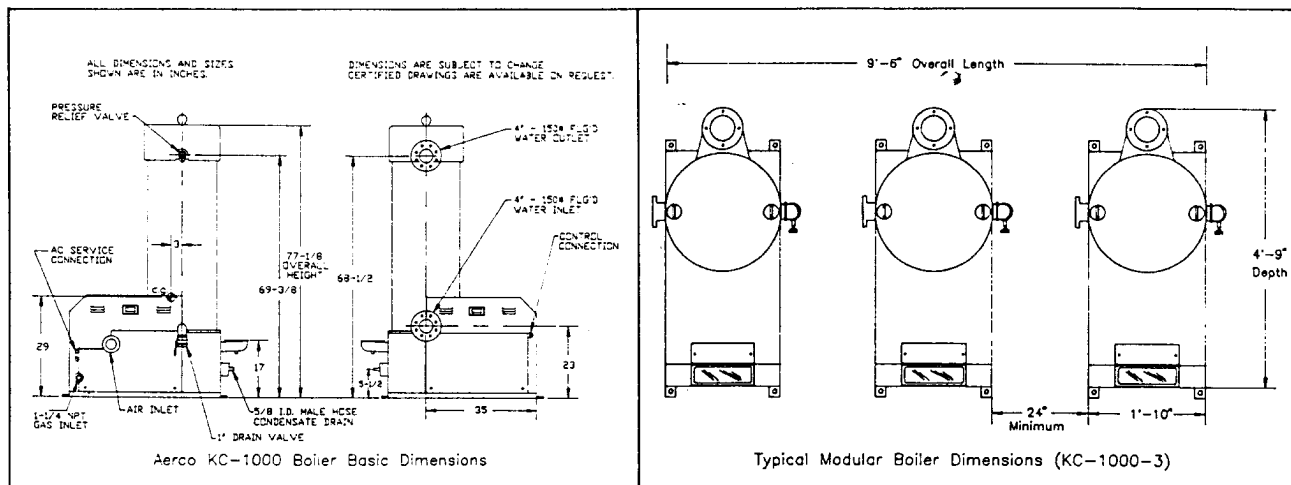
Minimum Water Flow .....	25 GPM
Maximum Water Flow .....	150 GPM
Water Pressure Drop .....	0.23 Ft. 100 GPM
Water Volume .....	23 Gallons
Control Range .....	50F to 220F
Standard Listings & Approvals .....	UL, ULC, FM, ASME
Optional Approval .....	IRI
Weight, Installed .....	1200 lbs.

\*Output is dependent upon return water temp. and firing rate—see efficiency curves on reverse.

†Up to 2000 Altitude.



## Dimensions KC-1000 Boiler



## Ratings and Dimensions

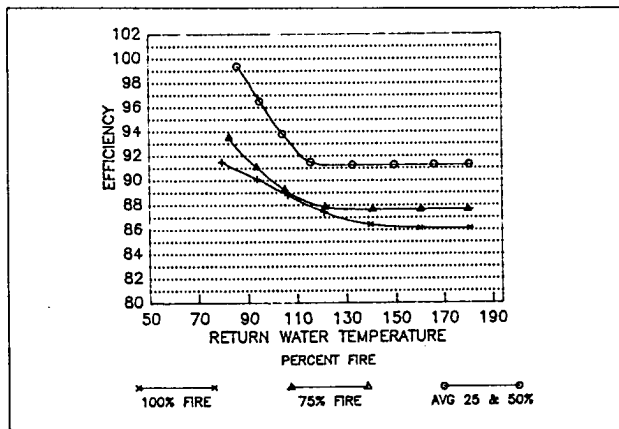
Modules	Model	Mbh Input	MBH Output	Length	Depth	Height	Weight
	(a)	(b)	(b) (c)				
One (1)	KC-1000	1000mbh	860mbh-915mbh	1'10"	4'9"	6'8"	1200lbs.
Two (2)	KC-1000-2	2000mbh	1720mbh-1830mbh	5'10"	4'9"	6'8"	2400lbs.
Three (3)	KC-1000-3	3000mbh	2580mbh-2745mbh	9'8"	4'9"	6'8"	3600lbs.
Four (4)	KC-1000-4	4000mbh	3440mbh-3660mbh	13'6"	4'9"	6'8"	4800lbs.
Five (5)	KC-1000-5	5000mbh	4300mbh-4575mbh	17'4"	4'9"	6'8"	6000lbs.
Six (6)	KC-1000-6	6000mbh	5160mbh-5490mbh	21'2"	4'9"	6'8"	7200lbs.
Seven (7)	KC-1000-7	7000mbh	6020mbh-6405mbh	25'	4'9"	6'8"	8400lbs.
Eight (8)	KC-1000-8	8000mbh	6880mbh-7320mbh	28'10"	4'9"	6'8"	9600lbs.

(a) Style to be Determined by Individual Application Requirement

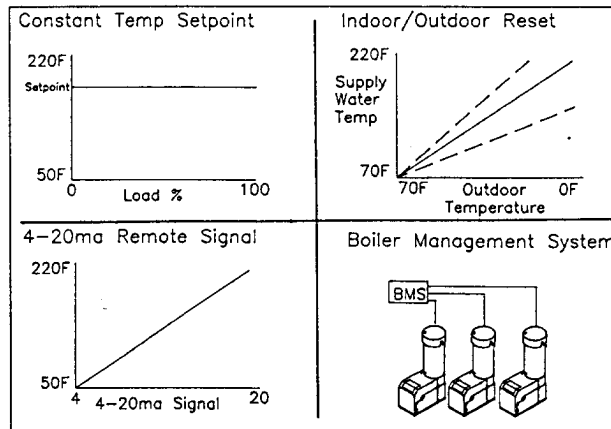
(b) Altitude below 2,000'. Apply Altitude Correction Factor above 2,000.

(c) Output dependent upon application-see efficiency curves.

## Efficiency Curves



## Programmable Modes of Operation



Represented by:

GFB-1 BBC 08/93 5M

HEAT EXCHANGES • WATER HEATERS • BOILERS

CONTROL VALVES • STEAM GENERATORS

**AERCO**

HOT WATER SYSTEMS

AERCO INTERNATIONAL, INC. • 159 PARIS AVE., P.O. BOX 128  
NORTHVALE, N.J. 07647-0128 • (201) 768-2400 • FAX 201-768-7789

APPENDIX F  
BUILDING AND EQUIPMENT DATA FORMS

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## BUILDING DESCRIPTION

NAME: Building 26129 (LSTC)

USE: Laser Systems Test Center, administration, offices and control rooms.

GROSS AREA (SQ.FT.): 89,400    STORIES: 4    DATE OF SURVEY: 10/10/95

DATE OF CONSTRUCTION: 1963, major remodel in 1982

STRUCTURE: Steel and concrete

EXTERIOR WALLS: 24" thick structural concrete, un-insulated.

ROOF: Reinforced 24" concrete deck and domes with 2" polyurethane foam insulation sprayed on.

FLOOR CONSTRUCTION: Concrete basement slab on piers, concrete on metal deck for all upper floors.

FLOOR FINISH: Sealed concrete in basement, mostly asphalt tile and raised computer floors elsewhere.

CEILINGS: Lay-in acoustical 2x4 tile.

WINDOWS: None

COOLING EQUIP: Single and multizone air handling units in basement. Units are served by two R-11 chillers in basement mechanical room.

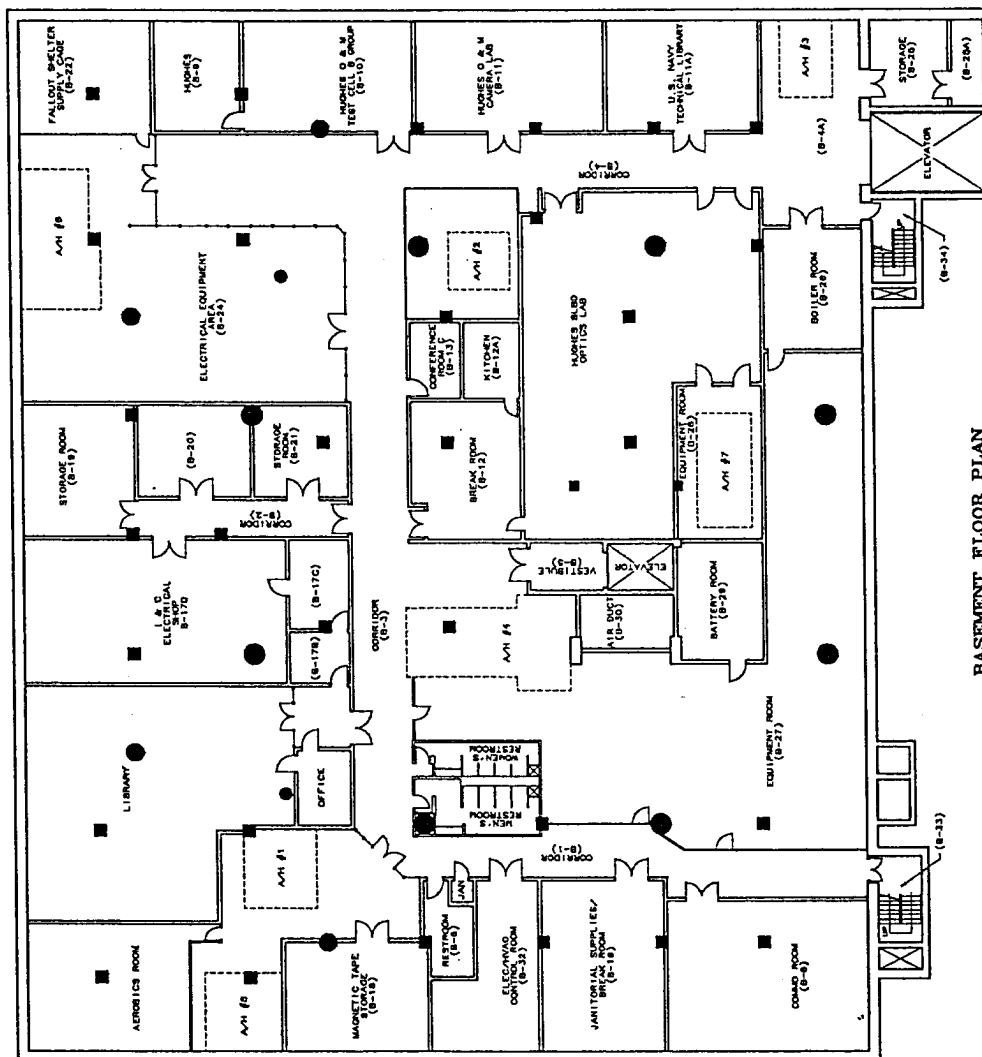
HEATING EQUIP: See cooling equipment above. Hot water heating coils are mounted in supply air ductwork to serve individual zones. Coils served by heat reclaim heat exchangers on both building chillers.

LIGHTING: Generally fluorescent fixtures of various types installed throughout building. All fixtures have F-40CW lamps and standard magnetic ballasts..

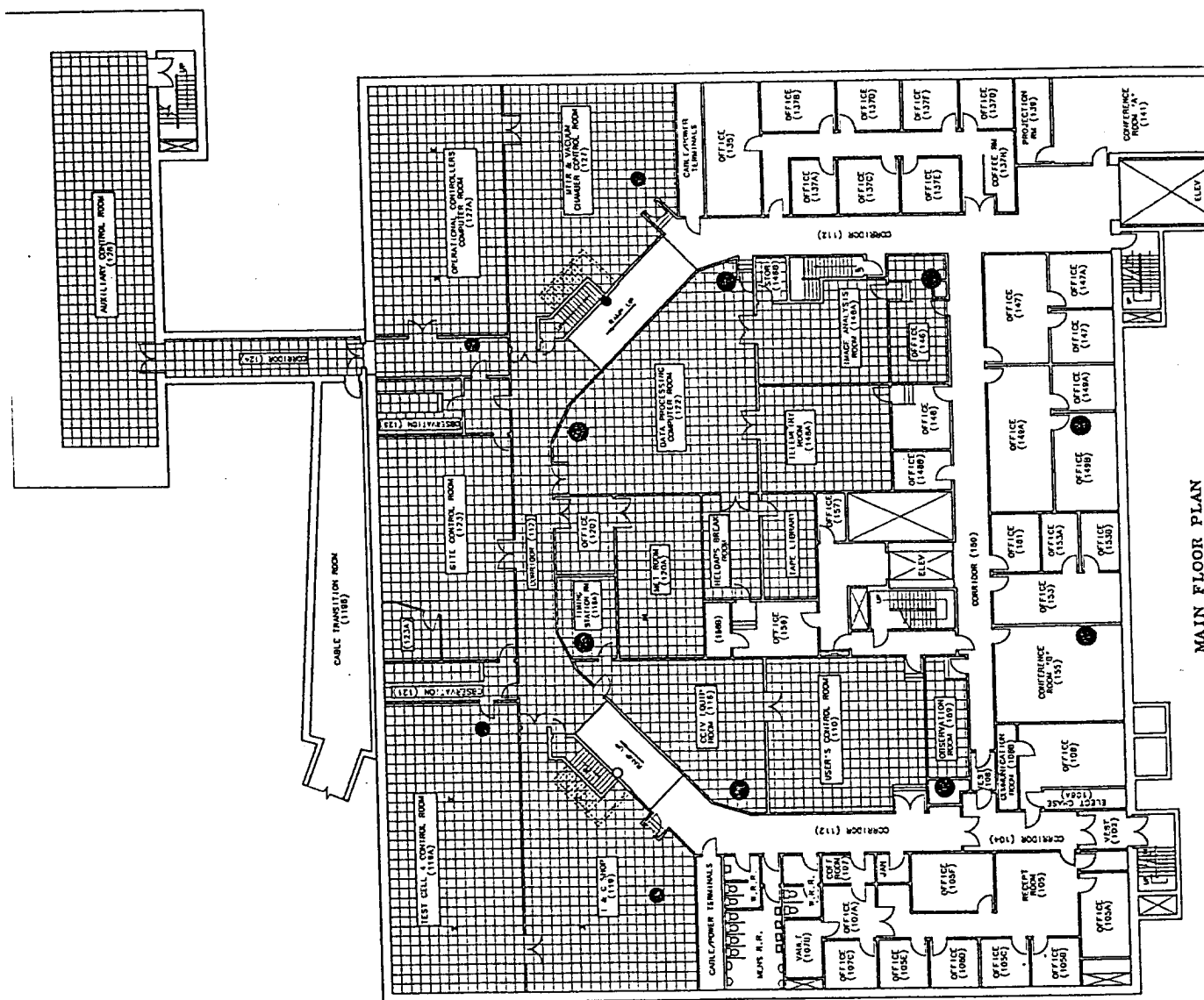
DOMESTIC WATER HEATING: Single electric water heater in basement to serve building restrooms.

OTHER: Electronic test monitoring and control equipment, as well as personal computers scattered throughout building.

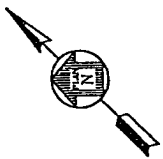
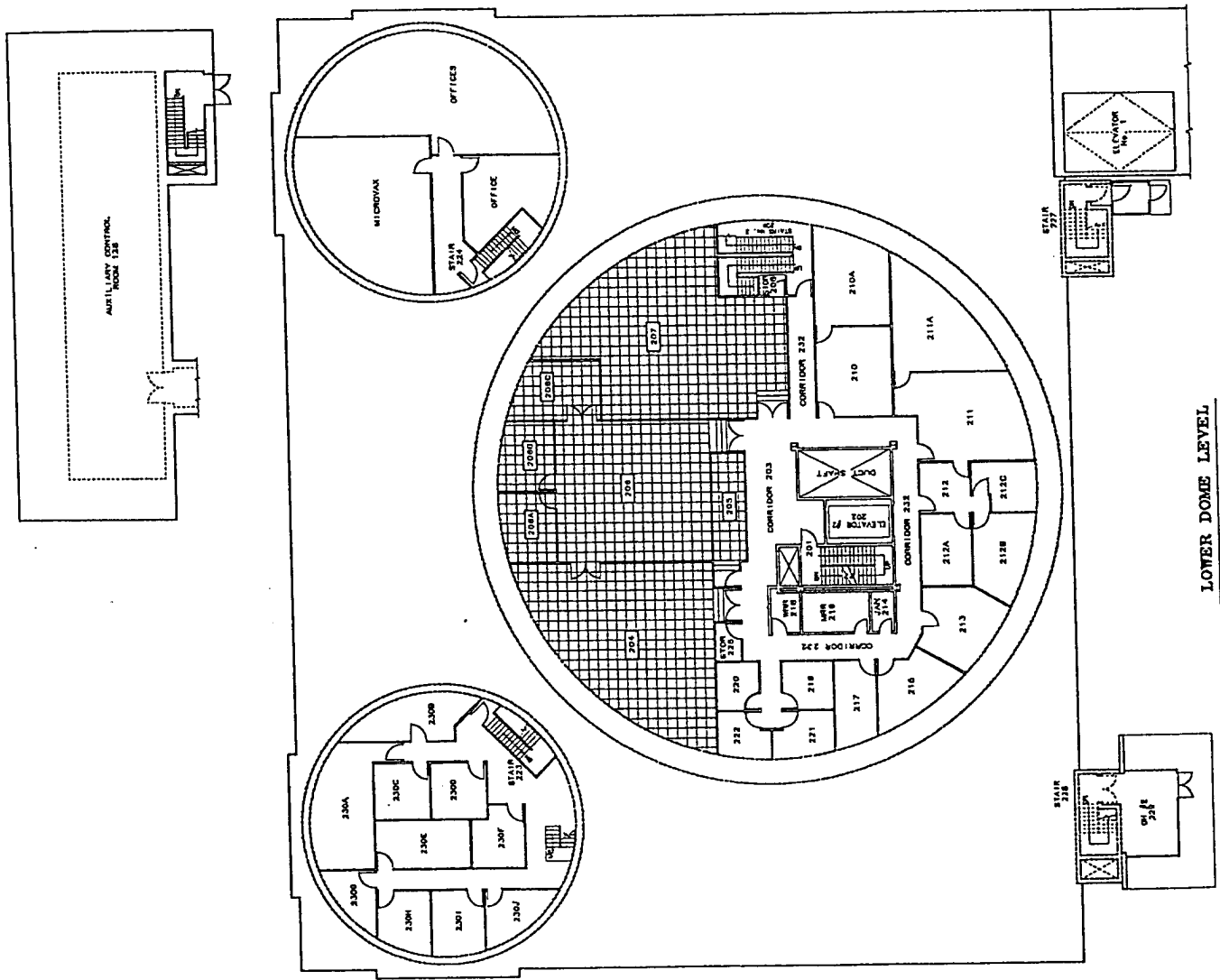
REMARKS: Poor temperature control, generally cold (67°F to 70°F) inside building during field survey. All electronics equipment and most lighting appears to be left on 24 hours a day. Some areas unoccupied but still conditioned and lighted.

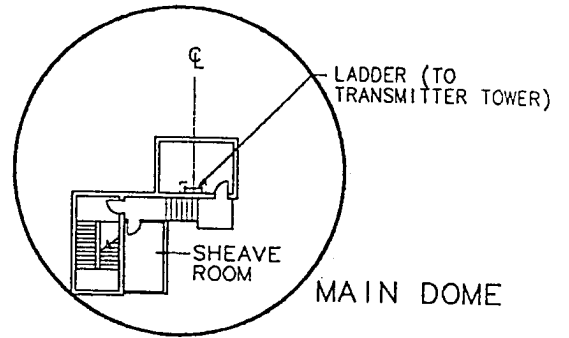
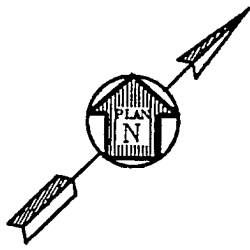


BASEMENT FLOOR PLAN

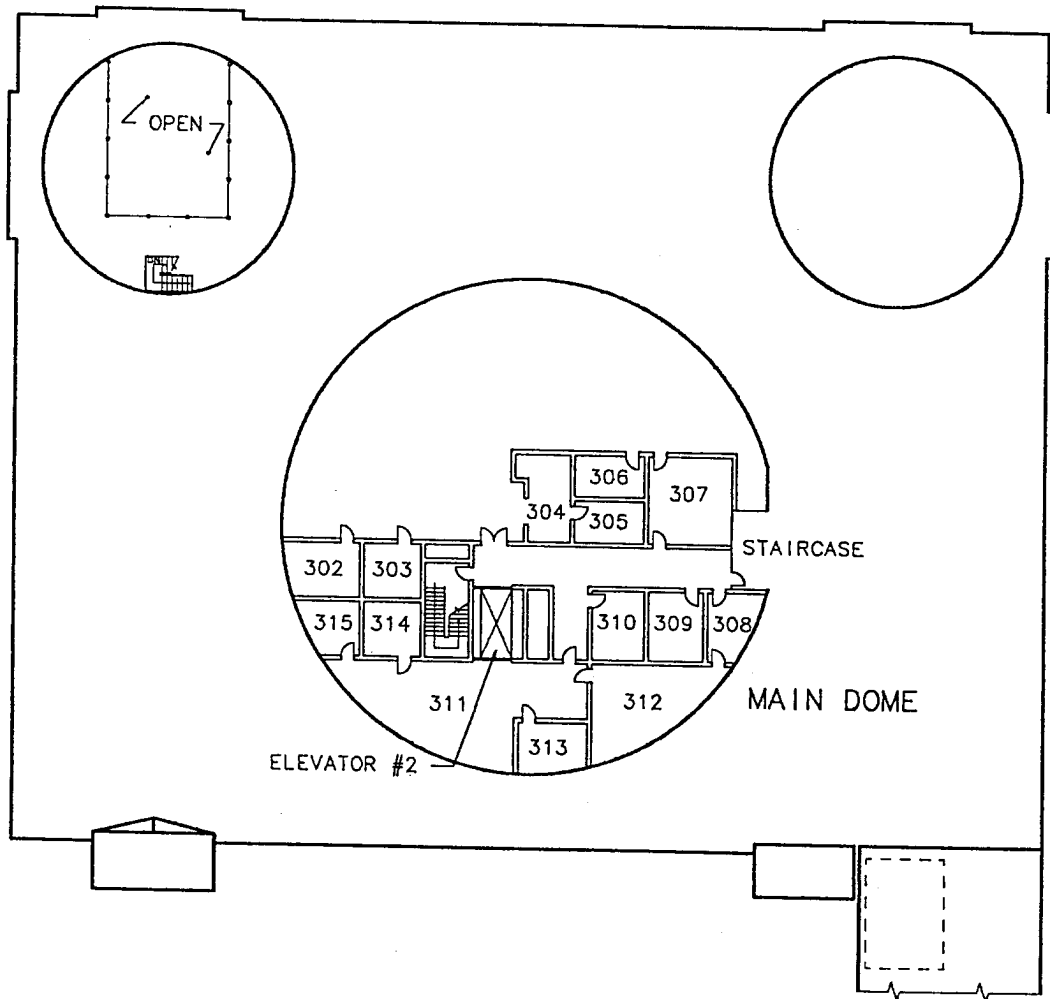








TOP OF DOME



UPPER DOME LEVEL

**HVAC EQUIPMENT LIST FOR: HELSTF Facility, LSTC Building**  
January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATING TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
Water Chiller CH-1	1	York OTA1M1B1-OGB, R-11 cooling only mode = 153.5 tons heat recovery mode = 91.7 tons	chilled water heating water (95F)	142.0 KW 88.0 KW (rec.)	by computer model			771,420	
Water Chiller CH-2	1	Hermetic Centr. 265 tons 7.5 degree delta T	<i>Decommissioned</i>		0	0	0	0	
Water Chiller CH-3	1	York OTA1M1B1-OGB, R-11 cooling only mode = 153.5 tons heat recovery mode = 91.7 tons	chilled water heating water (95F)	142.0 KW 88.0 KW (rec.)	by computer model			514,776	
Pump - P3A, P3B Domestic Water	2	10 hp	domestic water pressure	7.0 KW	2	7	52	20,384	
Pump - P5 Heating Water	1	Daco - 25 hp horizontal splitcase 300 gpm, 155'	heat recovery water from CH-1 & CH-3	16.6 KW	by computer model			145,416	
Pump - P7 Chilled Water	1	Daco - 60 hp horizontal splitcase 900 gpm, 163' head	chilled water CH-1 and CH-3	39.3 KW	by computer model			344,268	
Pump - P8 Chilled Water	1	Daco - 60 hp horizontal splitcase 870 gpm, 161'	<i>standby for P7</i>	47.6 KW	0	0	0	0	
Pump - 10A Condenser Water	1	GE 30 hp	condenser water CH-1	27.5 KW	by computer model			240,900	
Pump - 10B Condenser Water	1	GE 30 hp	condenser water CH-3	18.3 KW	by computer model			160,308	
Sump Pump	2	10 HP	sump water	6.6 KW	2	7	52	19,219	
Cooling Tower Fan CT-1A	1	BAC model CFT-2420C	condenser water	12.5 KW	by computer model			29,539	
Cooling Tower Fan CT-1B	1	BAC model CFT-2420C	condenser water	10.8 KW	by computer model			64,841	

**HVAC EQUIPMENT LIST FOR: HELSTF Facility, LSTC Building**  
January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATING TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
Steam Boiler	1	Kewanee Scotch Marine Model LS150-0 5023 MBH, 150 BHP	<i>Decommissioned</i>		0	0	0		0
Air Compressor AC # 1A	1	Quincy 15 HP - Reciprocating Tank #3 - 134 gallons	lab and control air	21.0 A 440.0 V - 3 ph. 16.0 KVA	8	7	52	38,671	
Air Compressor AC # 1B	1	Quincy 15 HP - Reciprocating Tank #3 - 134 gallons	lab and control air	18.5 A 440.0 V - 3 ph. 14.1 KVA	8	7	52	34,079	
Exhaust Fan EF - 1	1	Centrifugal 790 cfm	battery room	1.2 KW	by computer model			10,512	
Exhaust Fan EF - 2	1	Amer. Standard - Centrifugal 3769 cfm	general exhaust	2.7 KW	by computer model			23,652	
Water Heater Electric	1	A.O. Smith model DUE - 80 80 gallon	domestic hot water restrooms	24 KW	3	7	52	26,208	
Air Handling Unit - AHU-1 Hot Water Heat	1	American Standard multi-zone, 10 hp 16,770 cfm	basement	6.5 KW	by computer model			56,940	
Air Handling Unit - AHU-2 Hot Water Heat	1	American Standard multi-zone, 15 hp 22,620 cfm	basement	10.2 KW	by computer model			89,352	
Air Handling Unit - AHU-3 Hot Water Heat	1	American Standard multi-zone, 10 hp, spray coil 9060 cfm	optical areas	6.5 KW	by computer model			56,940	
Air Handling Unit - AHU-5 Hot Water Heat	1	American Standard single-zone, 25 hp, spray coil 17,400 cfm	main floor	17.3 KW	by computer model			151,548	
Air Handling Unit - AHU-6 Hot Water Heat	1	American Standard single-zone, 25 hp, spray coil 16,383 cfm	main floor domes	13.9 KW	by computer model			121,764	
Air Handling Unit - AHU-7 Hot Water Heat	1	American Standard multi-zone, 15 hp, spray coil 12,518 cfm	main floor dome 3 way control	7.4 KW	by computer model			64,824	

**HVAC EQUIPMENT LIST FOR: HELSTF Facility, LSTC Building**  
January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATING TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
Computer Room Unit AHU-8	1	Liebert FD305C 8643 cfm, 11 KW elect. heat	room 119	3.3 KW 11.0 KW	by computer model			28,908	
Computer Room Unit AHU-9	1	Liebert FD411C 11,962 cfm, 15 KW elect. heat	room 119A	5.6 KW 15.0 KW	by computer model			49,056	
Computer Room Unit AHU-10	1	Liebert FD139C 4,780 cfm, 6 KW elect. heat	room 123	1.8 KW 6.0 KW	by computer model			15,768	
Computer Room Unit AHU-11A	1	Liebert FD280C 7526 cfm, 10 KW elect. heat	room 127A	3.7 KW 10.0 KW	by computer model			32,412	
Computer Room Unit AHU-11B	1	Liebert FD280C 7467 cfm, 10 KW elect. heat	room 127A	4.7 KW 10.0 KW	by computer model			41,172	
Computer Room Unit AHU-12	1	Liebert FD305C 8800 cfm, 11.4 KW elect. heat	room 127	3.3 KW 11.4 KW	by computer model			28,908	
Computer Room Unit AHU-14	1	Liebert FD488C 11,513 cfm, 15 KW elect. heat	room 128	5.6 KW 15.0 KW	by computer model			49,056	
AHU-S1 Air Handling Unit Hot Water Heat	1	American Standard single-zone, 7-1/2 hp 7846 cfm, 100% O.A.	100% O.A.	4.0 KW	by computer model			29,779	
AHU-S4 Air Handling Unit Hot Water Heat	1	American Standard single-zone, 40 hp 47,933 cfm	computer rooms under floor	22.7 KW	by computer model			198,852	
Electronics Equipment Data Collection	1	all electronics equipment on UPS feeder.	data collection, instrumentation	60.20 A 480 V 50 KW	24	7	52	436,800	
TOTAL HEATING								0	

HVAC EQUIPMENT LIST FOR: HELSTF Facility, LSTC Building  
January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATING TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
TOTAL COOLING								1,380,576	
TOTAL DHW								26,208	
TOTAL FANS								1,049,443	
TOTAL PUMPS								930,495	
TOTAL MISC								509,550	

MOTOR LIST FOR: HELSTIF - LSTC													
DATE SURVEYED: October 10 - 13, 1995													
ITEM	QTY	DESCRIPTION	AREA SERVED	HP	PHASE	NAMEPLATE			ACTUAL		% LOAD	KW DEMAND	KVA
						VOLTS	AMPS	PF	VOLTS	AMPS			
P-5	1	Heating Water Pump	LSTC	25	3	460	32.5	0.833	460	25	76.9%	16.6	19.9
P-7	1	Chilled Water Pump	LSTC	60	3	460	77.0	0.796	460	62	80.5%	39.3	49.4
P-10A	1	Condenser Water Pump	CH-1	30	3	460	38.5	0.885	460	39	101.3%	27.5	31.1
P-10B	1	Condenser Water Pump	CH-3	30	3	460	36.0	0.885	460	26	72.2%	18.3	20.7
CT-1A	1	Cooling Tower	CH-1	15	3	460	19.5	0.850	460	18.5	94.9%	12.5	14.7
CT-1B	1	Cooling Tower	CH-3	15	3	460	19.5	0.850	460	16	82.1%	10.8	12.7
EF-1	1	Exhaust Fan	Battery Room	1.5	3	460	2.5	0.780	460	2	80.0%	1.2	1.6
EF-2	1	Exhaust Fan	LSTC	3	3	460	4.4	0.835	460	4	90.9%	2.7	3.2
AHU-1	1	Air Handling Unit w/ Hot Water Heating Coil	Basement	10	3	440	13.4	0.855	460	9.5	70.9%	6.5	7.6
AHU-2	1	Air Handling Unit w/ Hot Water Heating Coil	Basement	15	3	440	19.5	0.850	460	15	76.9%	10.2	12.0
AHU-3	1	Air Handling Unit w/ Hot Water Heating Coil	Optical Areas	10	3	440	13.4	0.855	460	9.5	70.9%	6.5	7.6
AHU-5	1	Air Handling Unit w/ Hot Water Heating Coil	Main Floor	25	3	440	30.9	0.870	460	25	80.9%	17.3	19.9
AHU-6	1	Air Handling Unit w/ Hot Water Heating Coil	Main Floor Domes	25	3	440	30.9	0.870	460	20	64.7%	13.9	15.9
AHU-7	1	Air Handling Unit w/ Hot Water Heating Coil	Main Floor Dome	15	3	440	19.3	0.850	460	11	57.0%	7.4	8.8
AHU-S1	1	Air Handling Unit w/ Hot Water Heating Coil	LSTC - Outside Air	7.5	3	440	10.0	0.830	460	6	60.0%	4.0	4.8
AHU-S4	1	Air Handling Unit w/ Hot Water Heating Coil	Computer Room Under Floor	40	3	440	48.0	0.865	460	33	68.8%	22.7	26.3
AHU-8	1	Air Handling Unit	Room 119	5	3	460	7.1	0.835	460	5	70.4%	3.3	4.0
AHU-9	1	Air Handling Unit	Room 119A	7.5	3	460	11.0	0.830	460	8.5	77.3%	5.6	6.8
AHU-10	1	Air Handling Unit	Room 123	2	3	460	3.1	0.750	460	3	96.8%	1.8	2.4

MOTOR LIST FOR: HELSTF - LSTC													
DATE SURVEYED: October 10 - 13, 1995													
ITEM	QTY	DESCRIPTION	AREA SERVED	HP	PHASE	NAMEPLATE			EFF	ACTUAL		% LOAD	KW DEMAND
						VOLTS	AMPS	PF		VOLTS	AMPS		
AHU-11A	1	Air Handling Unit	Room 127A	5	3	460	7.1	0.835	79.0%	460	5.5	77.5%	3.7
AHU-11B	1	Air Handling Unit	Room 127A	5	3	460	7.1	0.835	79.0%	460	7	98.6%	4.7
AHU-12	1	Air Handling Unit	Room 127	5	3	460	7.1	0.835	79.0%	460	5	70.4%	3.3
AHU-14	1	Air Handling Unit	Room 128	7.5	3	460	11.0	0.830	76.9%	460	8.5	77.3%	5.6
Total								0.846					245.4
													290.2



**LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC**

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Stairs - East and West	18	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	30	20	1,728 W	24	7	52	15,096	
Communications - B-8	34	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	43	50	3,264 W	24	7	52	28,514	
Mech. Room - B-27	31	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	20	15	2,976 W	24	7	52	25,998	
Battery Room - B-29	4	Explosion Proof Lampholder, 1-150W/A Lamp	150 W	Local Switch	10	15	600 W	24	7	52	5,242	
Corridor - B-1	9	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	26	10	864 W	24	7	52	7,548	
Janitor Supplies / Break Room - B-18	12	4' Pendant Industrial Fluorescent, Standard Ballast, 3-F40/T12/RS/CW Lamps	151 W	Local Switches	40	30	1,812 W	24	7	52	15,830	
Elec/HVAC Control Room - B-32	6	4' Surface Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	60	50	576 W	24	7	52	5,032	
Janitor Closet	1	Lampholder, 1-100W/A Lamp	100 W	Local Switch	12	5	100 W	24	7	52	874	
Restroom	1	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	55	20	96 W	24	7	52	839	
AHU Vestibule	11	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	23	15	1,056 W	24	7	52	9,225	

**LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC**

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Magnetic Tape Storage - B-18	6	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	10	5	576 W	24	7	52	5,032	
Aerobics Room	10	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	24	30	960 W	24	7	52	8,387	
Men's Restroom	3	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	22	20	288 W	24	7	52	2,516	
Women's Restroom	3	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	15	20	288 W	24	7	52	2,516	
Vestibule	1	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	10	15	96 W	24	7	52	839	
Office	2	4' Pendant Industrial Fluorescent, Standard Ballast, 3-F40/T12/RS/CW Lamps	151 W	Local Switch	34	50	302 W	9	5	52	707	
Library	23	4' Pendant Industrial Fluorescent, Standard Ballast, 3-F40/T12/RS/CW Lamps	151 W	Local Switch	20	20	3,473 W	24	7	52	30,340	
Office - B-17B	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	65	50	192 W	9	5	52	449	
Corridor - B-3	12	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	25	10	1,152 W	24	7	52	10,064	
Corridor - B-2	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	27	10	384 W	24	7	52	3,355	

LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
I&C Electrical Shop - B-17D	24	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	40	50	2,304 W	24	7	52	20,128	
Office - B-17C	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	42	50	384 W	9	5	52	899	
Storage - B-19	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	30	5	384 W	24	7	52	3,355	
Storage - B-20	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	30	5	384 W	24	7	52	3,355	
Storage - B-21	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	21	5	384 W	24	7	52	3,355	
Vestibule	2	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	15	15	192 W	24	7	52	1,677	
Vestibule - B-5	2	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	15	15	192 W	24	7	52	1,677	
Air Duct - B-30	3	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	26	15	288 W	24	7	52	2,516	
Break Room - B-12	6	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	35	30	576 W	24	7	52	5,032	
Kitchen - B-12A	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	40	30	288 W	24	7	52	2,516	

**LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC**

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Conference - B-13	1	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	Locked	30	192 W	24	7	52	1,677	
Electrical Equipment - B-24	14	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	30	15	1,344 W	24	7	52	11,741	
Fallout Shelter Supply - B-22	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	30	15	384 W	24	7	52	3,355	
Hughes - B-9	6	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	120	50	1,152 W	24	7	52	10,064	
Hughes O&M Test Cell B Group - B-10	12	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	55	50	2,304 W	24	7	52	20,128	
Hughes O&M Camera Lab - B-11	18	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	50	50	3,456 W	24	7	52	30,192	
Corridor - B-4	15	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breakers	15	10	1,440 W	24	7	52	12,580	
Hughes SLBD Optics Lab	32	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	45	50	3,072 W	24	7	52	26,837	
Equipment Room - B-28	3	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	15	15	288 W	24	7	52	2,516	
US Navy Library - B-11A	6	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	60	30	1,152 W	24	7	52	10,064	

LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Vestibule - B-4A	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	20	15	384 W	24	7	52	3,355	
Boiler Room - B-26	5	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	25	15	480 W	24	7	52	4,193	
Storage - B-25	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	25	5	384 W	24	7	52	3,355	
Storage - B-25A	2	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	20	5	192 W	24	7	52	1,677	
Basement Mezzanine	9	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	20	20	864 W	24	7	52	7,548	
Vestibule - 102	1	4' Pendant Industrial Fluorescent, Standard Ballast, 1-F40/T12/RS/CW Lamps	55 W	Breaker	23	10	55 W	24	7	52	480	
Closet - 105	1	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	30	5	96 W	24	7	52	839	
Office - 105A	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	63	50	384 W	9	5	52	899	
Reception - 105	11	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	62	50	1,056 W	24	7	52	9,225	
Office - 105B	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	95	50	384 W	9	5	52	899	

# LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Office - 105C	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	57	50	384 W	9	5	52	899	
Office - 105F	6	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	50	50	576 W	9	5	52	1,348	
Office - 105E	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	80	50	384 W	9	5	52	899	
Office - 105D	4	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	75	50	384 W	9	5	52	899	
Office - 107A	4	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	65	50	384 W	24	7	52	3,355	
Office - 107C	4	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	86	50	384 W	9	5	52	899	
Office - 107	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	110	50	192 W	24	7	52	1,677	
Vault - 107B	2	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	83	10	192 W	24	7	52	1,677	
Janitor	1	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	30	5	96 W	24	7	52	839	
Corridor - 112	16	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	14	10	1,536 W	24	7	52	13,418	

**LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC**

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Corridor - 104	2	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	27	10	192 W	24	7	52	1,677	
Women's Restroom	2	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	80	20	192 W	24	7	52	1,677	
Men's Restroom	2	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	75	20	192 W	24	7	52	1,677	
Women's Restroom	3	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	70	20	288 W	24	7	52	2,516	
Cable/Power Terminals	2	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	10	10	192 W	24	7	52	1,677	
I & C shop - 119	28	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	45	50	2,688 W	24	7	52	23,482	
Test Cell 4 Control Room - 119A	28	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	85	50	5,376 W	24	7	52	46,965	
Cable Transition Room - 119B	8	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	27	10	768 W	24	7	52	6,709	
Observation - 121	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	64	50	384 W	24	7	52	3,355	
Site control Room - 123	21	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	40	50	2,016 W	24	7	52	17,612	

**LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC**

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Site Control Office - 123A	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40T12/RS/CW Lamps	96 W	Local Switch	75	50	192 W	9	5	52	449	
Vestibule	1	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40T12/RS/CW Lamps	96 W	Local Switch	23	10	96 W	24	7	52	839	
Observation - 125	3	1'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40T12/RS/CW Lamps	96 W	Local Switch	50	30	288 W	24	7	52	2,516	
Corridor - 124	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40T12/RS/CW Lamps	96 W	Local Switch	108	10	384 W	24	7	52	3,355	
	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40T12/RS/CW Lamps	192 W	Local Switch	108	10	768 W	24	7	52	6,709	
Auxiliary Control Room - 128	20	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40T12/RS/CW Lamps	192 W	Local Switches	70	50	3,840 W	24	7	52	33,546	
Operational Controllers Computer Room - 127A	24	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40T12/RS/CW Lamps	96 W	Local Switches	33	50	2,304 W	24	7	52	20,128	
MTIR & Vacuum Chamber control Room - 127	31	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40T12/RS/CW Lamps	96 W	Local Switches	37	50	2,976 W	24	7	52	25,998	
Cable/Power Terminals	2	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40T12/RS/CW Lamps	96 W	Local Switch	10	10	192 W	24	7	52	1,677	
Office - 135	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40T12/RS/CW Lamps	96 W	Local Switch	37	50	192 W	9	5	52	449	



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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Conference Room - 135A	5	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	30	30	480 W	24	7	52	4,193	
Office - 137A	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	52	50	384 W	9	5	52	899	
Office - 137B	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	53	50	384 W	9	5	52	899	
Office - 137C	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	62	50	384 W	9	5	52	899	
Office - 137D	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	52	50	384 W	9	5	52	899	
Office - 137E	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	65	50	384 W	9	5	52	899	
Office - 137F	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	78	50	384 W	9	5	52	899	
Office - 137G	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	80	50	384 W	9	5	52	899	
Corridor & Coffee Room - 137H	7	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	37	15	672 W	24	7	52	5,871	
Projection Room - 139	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	66	30	384 W	24	7	52	3,355	

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October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Conference Room "A" - 141	12	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	40	30	1,152 W	24	7	52	10,064	
Office - 147C	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	47	50	192 W	9	5	52	449	
Office - 147	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	50	50	384 W	9	5	52	899	
Office - 147A	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	47	50	384 W	9	5	52	899	
Office - 147B	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	43	50	384 W	9	5	52	899	
Corridor - 150	8	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	20	10	768 W	24	7	52	6,709	
Office - 149	8	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	43	50	768 W	9	5	52	1,797	
Office - 149A	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	57	50	384 W	9	5	52	899	
Office - 149B	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	54	50	768 W	9	5	52	1,797	
Office - 151	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	80	50	384 W	9	5	52	899	

LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC

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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Office - 153	8	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	36	50	768 W	9	5	52	1,797	
Office - 153A	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	76	50	384 W	9	5	52	899	
Office - 153B	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	78	50	384 W	9	5	52	899	
Conference Room "B" - 155	8	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	83	30	1,536 W	24	7	52	13,418	
Electrical Chase - 106A	2	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	Closed	15	192 W	24	7	52	1,677	
Communication Room - 106B	1	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	Closed	15	96 W	24	7	52	839	
Office - 106	8	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	65	50	768 W	9	5	52	1,797	
Vestibule - 108	1	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	41	10	96 W	24	7	52	839	
Observation Room - 159	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	Closed	30	288 W	24	7	52	2,516	
User's Control Room - 110	23	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	45	50	2,208 W	24	7	52	19,289	

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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
CCTV Equipment Room - 116	18	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	48	50	1,728 W	24	7	52	15,096	
Timing Station Room - 116A	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	45	50	384 W	24	7	52	3,355	
Office - 120	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	50	50	384 W	24	7	52	3,355	
MET Room - 120A	12	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	62	50	2,304 W	24	7	52	20,128	
Data Processing Computer Room - 122	21	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	71	50	4,032 W	24	7	52	35,224	
HELDPS Break Room	8	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	63	15	768 W	24	7	52	6,709	
Tape Library	8	4' Pendant Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	70	5	768 W	24	7	52	6,709	
Telemetry Room - 148A	15	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	98	50	2,880 W	24	7	52	25,160	
Office 148	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	36	50	384 W	24	7	52	3,355	
Office 148B	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	26	50	192 W	9	5	52	449	

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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Image Analysis Room - 146A	10	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	30	50	960 W	24	7	52	8,387	
Storage - 146B	1	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	50	5	96 W	24	7	52	839	
Office - 146	5	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	38	50	480 W	24	7	52	4,193	
Corridor - 157	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	20	10	384 W	24	7	52	3,355	
	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	40	10	288 W	24	7	52	2,516	
Office - 157	1	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	50	50	96 W	9	5	52	225	
Office - 156	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	60	50	384 W	9	5	52	899	
Storage - 156A	1	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	Closed	5	96 W	24	7	52	839	
Main Stairs - 201	5	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	12	20	480 W	24	7	52	4,193	
East Stairs - 209	5	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	12	20	480 W	24	7	52	4,193	

**LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC**

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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Corridor - 203	4	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	11	10	384 W	24	7	52	3,355	
Storage - 225	1	Surface Incandescent Downlight, 2-100W/A Lamp	200 W	Local Switch	9	5	200 W	24	7	52	1,747	
Computer Room - 205	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	82	50	576 W	24	7	52	5,032	
Test Cell #3 Control - 206	22	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	66	50	2,112 W	24	7	52	18,450	
Office - 206A	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	68	50	288 W	24	7	52	2,516	
Office - 206B	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	55	50	384 W	24	7	52	3,355	
Test Cell #3A Instrumentation - 204	22	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	54	50	2,112 W	24	7	52	18,450	
Office - 206C	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	27	50	192 W	24	7	52	1,677	
Test Cell #3B Instrumentation - 207	26	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	46	50	2,496 W	24	7	52	21,805	
Storage - 208	1	Lampholder, 1-150W/A Lamp	150 W	Local Switch	15	5	150 W	24	7	52	1,310	

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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Corridor - 232	10	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	11	10	960 W	24	7	52	8,387	
Office - 210	6	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	50	50	576 W	9	5	52	1,348	
Office - 210A	6	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	45	50	576 W	9	5	52	1,348	
Office - 211	7	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	90	50	1,344 W	9	5	52	3,145	
Office - 211A	6	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	65	50	576 W	9	5	52	1,348	
Reception - 212	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	70	50	384 W	9	5	52	899	
Office - 212A	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	52	50	384 W	9	5	52	899	
Office - 212B	5	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	55	50	480 W	9	5	52	1,123	
Office - 212C	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	80	50	384 W	9	5	52	899	
Office - 213	5	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	31	50	480 W	9	5	52	1,123	

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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Office - 215	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	29	50	288 W	9	5	52	674	
Janitor - 214	1	Lampholder, 1-100W/A Lamp	100 W	Local Switch	10	5	100 W	24	7	52	874	
Office - 217	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	82	50	384 W	9	5	52	899	
Mens Restroom - 216	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	23	20	192 W	24	7	52	1,677	
Womens Restroom - 218	1	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	40	20	96 W	24	7	52	839	
Office - 219	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	97	50	384 W	9	5	52	899	
Office - 221	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	76	50	384 W	9	5	52	899	
Office - 222	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	82	50	384 W	9	5	52	899	
Office - 220	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	80	50	384 W	9	5	52	899	
Corridor - 300	6	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	26	10	576 W	24	7	52	5,032	



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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Copy Room - 308	1	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	Light Out	30	96 W	24	7	52	839	
Office - 312	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	52	50	768 W	24	7	52	6,709	
Office - 309	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	38	50	384 W	24	7	52	3,355	
Office - 307	5	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	65	50	480 W	24	7	52	4,193	
Office - 305	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	65	50	768 W	24	7	52	6,709	
Office - 304	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	40	50	576 W	24	7	52	5,032	
VAX - 301	30	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	61	50	5,760 W	24	7	52	50,319	
Office - 306	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	92	50	768 W	24	7	52	6,709	
Office - 303	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	40	50	384 W	24	7	52	3,355	
Office - 302	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	76	50	768 W	24	7	52	6,709	

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AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Office - 310	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	53	50	384 W	24	7	52	3,355	
Office - 311	9	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	62	50	1,728 W	24	7	52	15,096	
Office - 313	2	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	33	50	384 W	24	7	52	3,355	
Office - 314	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	74	50	576 W	24	7	52	5,032	
Office - 315	1	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	41	50	192 W	24	7	52	1,677	
Stairs - 223	3	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	28	20	288 W	24	7	52	2,516	
Corridor - 230	12	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	10	1,152 W	24	7	52	10,064	
Office - 230A	5	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	480 W	24	7	52	4,193	
Office - 230B	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	384 W	24	7	52	3,355	
Office - 230C	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	288 W	24	7	52	2,516	

LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC  
October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Office - 230D	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	60	50	288 W	24	7	52	2,516	
Office - 230E	4	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	384 W	24	7	52	3,355	
Office - 230F	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	288 W	24	7	52	2,516	
Office - 230G	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	288 W	24	7	52	2,516	
Office - 230H	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	288 W	24	7	52	2,516	
Office - 230I	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	288 W	24	7	52	2,516	
Office - 230J	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W		60	50	288 W	24	7	52	2,516	
Storage - 330	19	1'x4' Pendant Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	41	50	1,824 W	24	7	52	15,934	
Stair - 224	3	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	28	20	288 W	24	7	52	2,516	
Corridor - 231	3	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Breaker	38	10	288 W	24	7	52	2,516	

LIGHTING EQUIPMENT LIST FOR: HELSTF - LSTC

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Office - 231A	6	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	Closed	50	576 W	24	7	52	5,032	
Office - 231B	23	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	89	50	2,208 W	24	7	52	19,289	
Microvax - 231C	16	2'x4' Recessed Fluorescent Troffer, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	Closed	50	1,536 W	24	7	52	13,418	
Exits	15	Wall Exit Sign, Incandescent Lamps	25 W	Breaker	N/A	N/A	375 W	24	7	52	3,276	
TOTAL ENERGY USE							151,359 W				1,188,959	0

## BUILDING DESCRIPTION

NAME: Test Cell 1 (TC-1)

USE: Laser systems testing facility.

GROSS AREA (SQ.FT.): 19,329    STORIES: 4    DATE OF SURVEY: 10/10/95

DATE OF CONSTRUCTION: 1982

STRUCTURE: Steel and masonry

EXTERIOR WALLS: Concrete masonry units with 3" fiberglass batt insulation on first and second levels, un-insulated steel siding on third and fourth (PT tower).

ROOF: Flat built-up roof with 6" rigid insulation over second level, steel panels over fourth level (PT tower).

FLOOR CONSTRUCTION: 6" slab on grade, concrete on metal deck for all upper floors.

FLOOR FINISH: Sealed concrete and asphalt tile.

CEILINGS: None.

WINDOWS: None.

COOLING EQUIP: Multiple single zone air handling units, all served by two central water chillers in Test Cell 2 building.

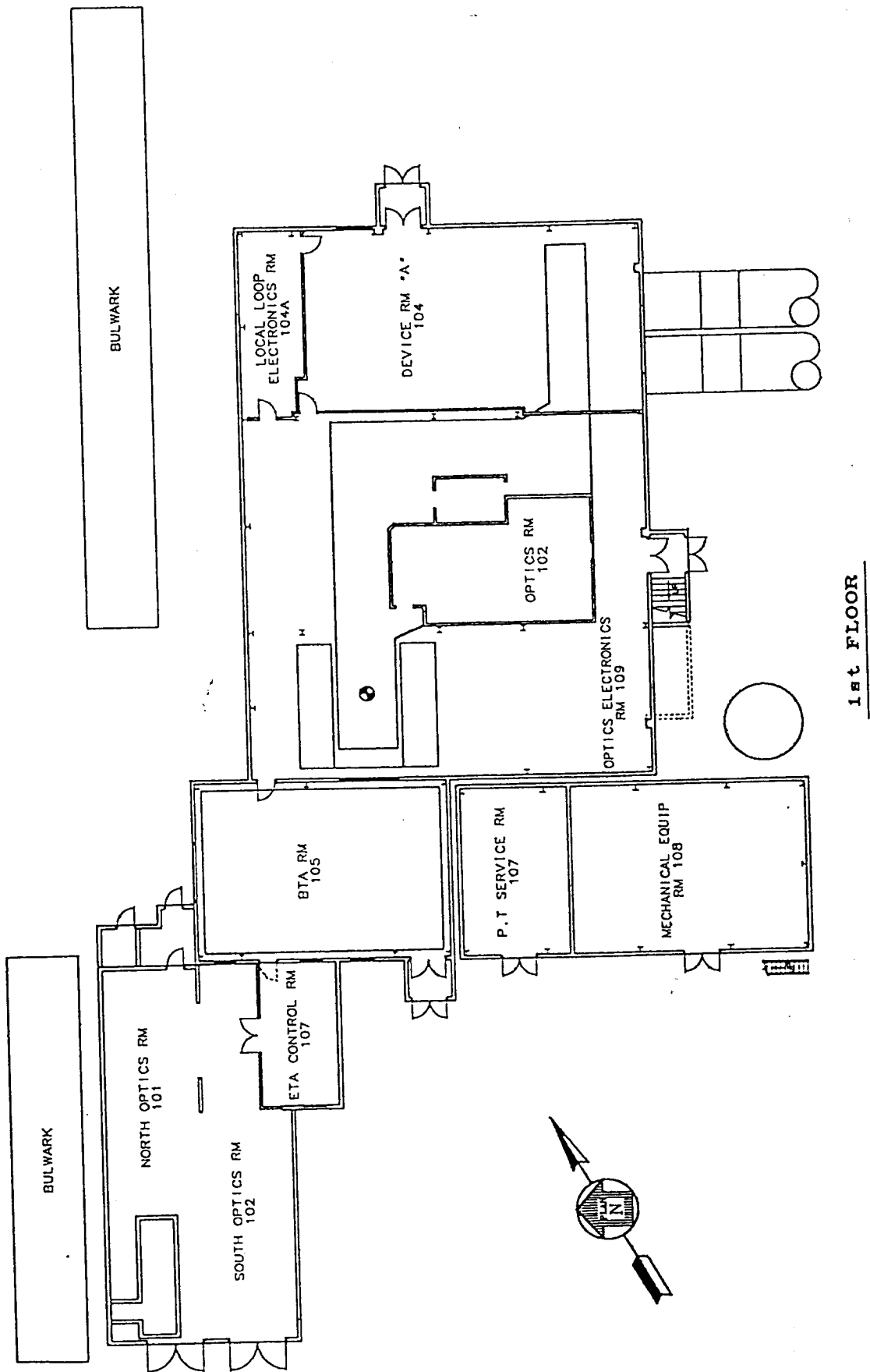
HEATING EQUIP: See cooling equipment above. All units are served by two central boilers in Test Cell 2 building.

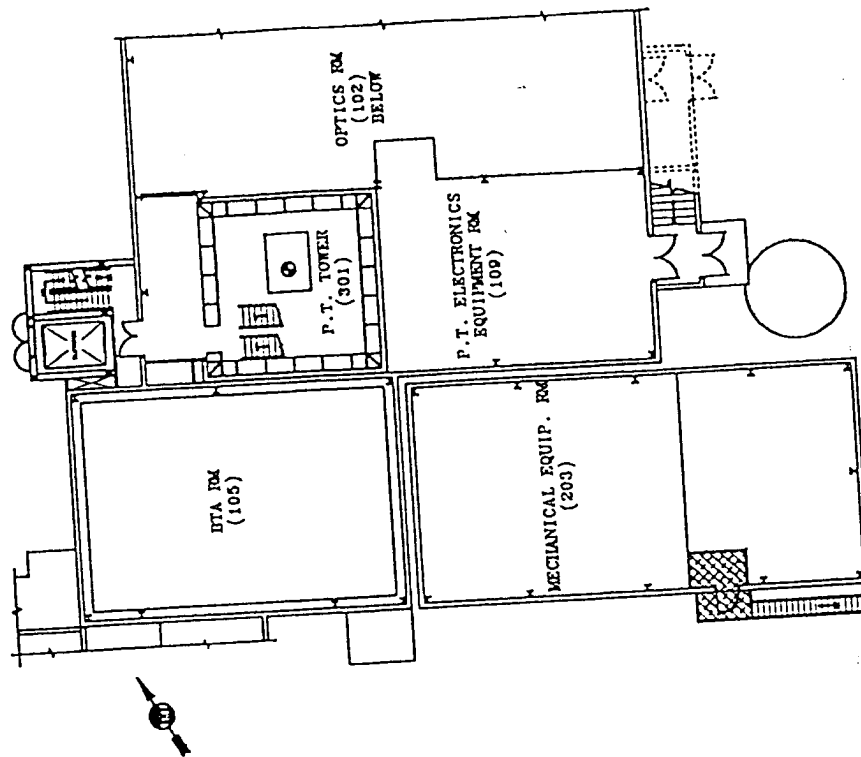
LIGHTING: Mainly high pressure sodium fixtures with some fluorescent lighting in control rooms and other areas.

DOMESTIC WATER HEATING: None.

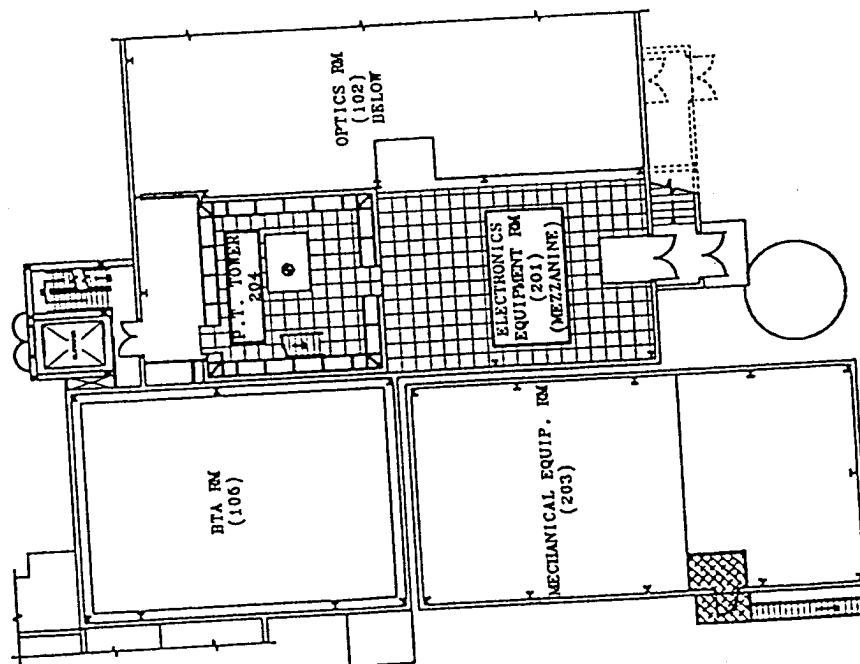
OTHER: Electronic test monitoring and control equipment, as well as personal computers scattered throughout building. Also various laser systems equipment in many areas of building.

REMARKS: Attempts to maintain precise temperature and humidity conditions 24 hours a day add to excessive energy consumption in building.

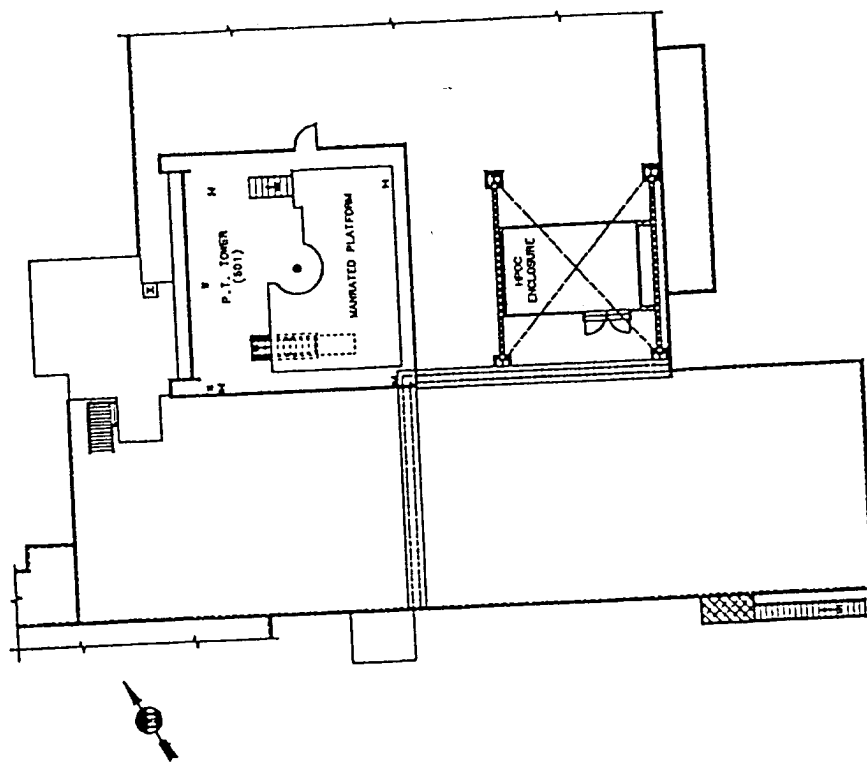




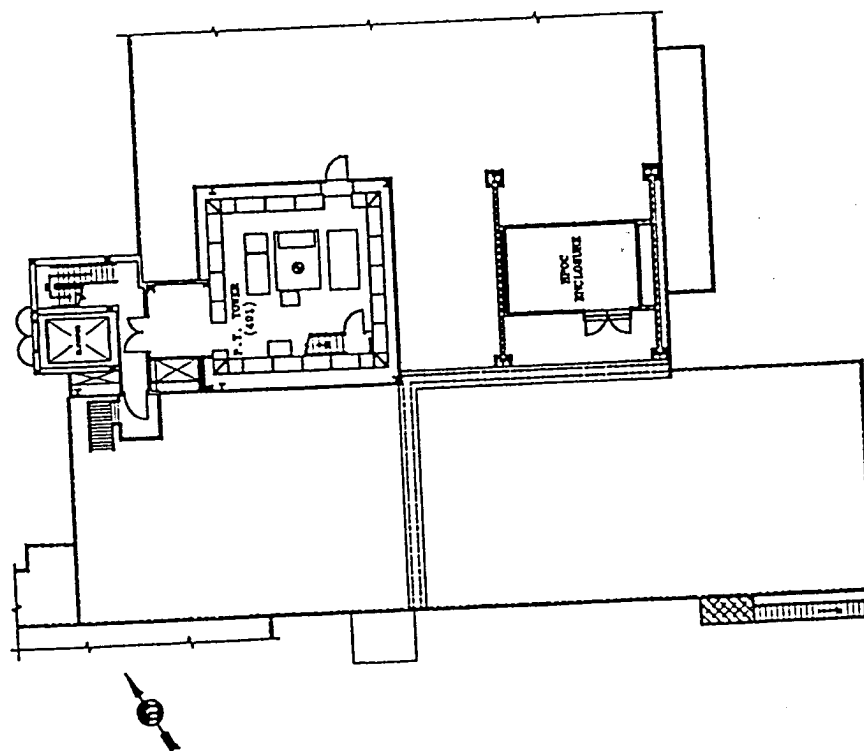
PARTIAL FLOOR PLAN EL 81'-0"



PARTIAL SECOND FLOOR PLAN EL 71'-0"



PARTIAL ROOF PLAN EL 103'-0"



P. T. FLOOR PLAN EL 91'-0"



# HVAC EQUIPMENT LIST FOR: HELSTF Facility, Test Cell # 1

January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATION TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
Air Handling Unit AH-1 Hot Water Heat	1	McQuay RD5802BY 10 hp single zone	Optics Room	8.7 KW	by computer model			76,212	
Air Handling Unit AH-2 Hot Water Heat	1	McQuay RD5708BY 3 hp single zone	P.T. tower	2.1 KW	by computer model			18,396	
Air Handling Unit AH-3 Hot Water Heat	1	McQuay RD5800BY 10 hp S.fan, 5 hp R. fan single zone	P.T. tower 204, 301, 401	10.3 KW	by computer model			90,228	
Air Handling Unit AH-4 Hot Water Heat	1	Carrier 5 hp S.fan, 2 hp R. fan single zone	N & S Optics Room 101 & 102	4.9 KW	by computer model			42,924	
Air Handling Unit AH-5 Hot Water Heat	1	Trane 7.5 hp single zone	BTA Room 105	4.1 KW	by computer model			35,916	
Air Handling Unit AH-51 Hot Water Heat	1	York 7.5 hp, 5892 cfm single zone	Device Room 104	4.9 KW	by computer model			42,924	
Air Handling Unit AH-52 Hot Water Heat	1	York 3 hp, 3344 cfm single zone	ETA Control Room	1.7 KW	by computer model			14,892	
Air Handling Unit AH-53 Hot Water Heat	1	York 15 hp, 10,758 cfm single zone	Optics Room 102	8.6 KW	by computer model			75,336	
Electric Humidifier EH - 53	1	Carnes HCJD 138 lbs/hr.	Optics Room 102 AH-53	22.4 KW	8	7	52	65,229	
Air Handling Unit AH-54 Hot Water Heat	1	York C53365HFCLD-Y 7.5 hp, 15,667 cfm single zone	Optics Electr. Rm. 109	4.4 KW	by computer model			38,544	
Air Handling Unit AH-55 Hot Water Heat	1	York C52175HFCLP-Y 7.5 hp, 10,386 cfm single zone	Optics Equip. Rm. 201	4.1 KW	by computer model			35,916	
Evap. Cooler EC-51	1	Sun #E63022 5 hp, 15,700 cfm	room 107, PT service	3.0 KW	24	7	26	13,104	

# HVAC EQUIPMENT LIST FOR: HELSTF Facility, Test Cell # 1

January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATION TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
Evap. Cooler EC-52	1	Sun Manufacturing 1.5 hp, 3800 cfm, sz	mechanical room	1.3 KW	24	7	26	5,678	
Packaged Rooftop Unit Heat Pump	1	Carrier 50YM024310 2 ton	HPOC Enclosure	2 Ton 10 EER 10 KW	8 8	7 7	26 26	3,494 14,560	
Electronics Equipment Data Collection	1	all electronics equipment on UPS feeder.	data collection, instrumentation	26.60 A 480 V 22 KW	24	7	52	192,192	
TOTAL HEATING								14,560	0
TOTAL COOLING								3,494	0
TOTAL FANS								93,242	
TOTAL MISC								192,192	

MOTOR LIST FOR: HELSTF - TEST CELL 1  
DATE SURVEYED: October 10 - 13, 1995

DATE SURVEYED: October 10 - 13, 1995																
ITEM	QTY	DESCRIPTION	AREA SERVED	HP	PHASE	NAMEPLATE			EFF	ACTUAL		% LOAD	KW DEMAND	KVA		
						VOLTS	AMPS	PF		VOLTS	AMPS					
AH-1	1	Air Handling Unit	Optics Room	10	3	200	30.0	0.875	85.6%	208	27.5	91.7%	8.7	9.9		
AH-2	1	Air Handling Unit	P.T. Tower	3	3	460	4.5	0.770	81.5%	460	3.5	77.8%	2.1	2.8		
AH-3	1	Air Handling Unit - Supply Fan	P.T. Tower, 201, 301, 401	10	3	460	12.5	0.875	85.6%	480	9.75	78.0%	7.1	8.1		
	1	Air Handling Unit - Return Fan		5	3	460	7.2	0.820	84.0%	480	4.7	65.3%	3.2	3.9		
AH-4	1	Air Handling Unit - Supply Fan	North Optics - 101 South Optics - 102	5	3	460	7.2	0.820	84.0%	480	5.2	72.2%	3.5	4.3		
	1	Air Handling Unit - Return Fan		2	3	460	3.2	0.750	78.0%	480	2.3	71.9%	1.4	1.9		
AH-5	1	Air Handling Unit	BTA Room 105	7.5	3	460	9.8	0.830	86.5%	480	6	61.2%	4.1	5.0		
AH-51	1	Air Handling Unit	Device Room 104	7.5	3	460	10.0	0.821	85.5%	460	7.5	75.0%	4.9	6.0		
AH-52	1	Air Handling Unit	ETA Control Room	3	3	460	4.5	0.835	74.7%	460	2.5	55.6%	1.7	2.0		
AH-53	1	Air Handling Unit	Optics Room 102	15	3	460	21.0	0.764	87.5%	480	13.5	64.3%	8.6	11.2		
AH-54	1	Air Handling Unit	Optics Elect. Room 109	7.5	3	460	10.0	0.821	85.5%	480	6.5	65.0%	4.4	5.4		
AH-55	1	Air Handling Unit	Optics Elect. Room 201	7.5	3	460	11.0	0.830	76.9%	480	6	54.5%	4.1	5.0		
TOTAL								0.821					53.8	65.5		

LIGHTING EQUIPMENT LIST FOR: HELSTF - TEST CELL 1												
October 10 - 13, 1995												
AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
North Optics Room - 101	45	1'x4' Pendant Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	65	50	4,320 W	24	7	52	37,740	
South Optics Room - 102	30	1'x4' Pendant Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switches	43	50	2,880 W	24	7	52	25,160	
ETA Control Room - 103	2	2'x2' Surface HID, 1-150W/HPS Lamp	200 W	Local Switch	43	50	400 W	24	7	52	3,494	
Storage - 104	9	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	89	50	864 W	24	7	52	7,548	
Vestibule - 105	1	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	Closed	5	96 W	24	7	52	839	
Vestibule - 101	1	Enclosed/Gasketed Lampholder, 1-100W/A Lamp	100 W	Local Switch	50	10	100 W	24	7	52	874	
Optics Room - 102	12	Pendent High-Bay HID, 1-400W/HPS Lamp	460 W	Breakers	81	50	5,520 W	24	7	52	48,223	
Vestibule - 103	6	Pendent High-Bay Incandescent, 1-100W/A Lamp	100 W	Breakers	81	50	600 W	24	7	52	5,242	
Vestibule - 103	1	Enclosed/Gasketed Lampholder, 1-200W/A Lamp	200 W	Breaker	59	10	200 W	24	7	52	1,747	

**LIGHTING EQUIPMENT LIST FOR: HELSTF - TEST CELL 1**  
October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Device Room - 104	30	Pendent High-Bay HID, 1-400W/HPS Lamp	460 W	Breakers	15	50	13,800 W	24	7	52	120,557	
	6	Pendent High-Bay Incandescent, 1-200W/A Lamp	200 W	Breaker	15	50	1,200 W	24	7	52	10,483	
Local Loop Electronics Room - 104A	10	4' Pendent Industrial Fluorescent, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switches	98	50	1,920 W	24	7	52	16,773	
BTA Room - 105	16	Pendent High-Bay HID, 1-400W/HPS Lamp	460 W	Breakers	10	50	7,360 W	24	7	52	64,297	
	2	Pendent High-Bay Incandescent, 1-200W/A Lamp	200 W	Breaker	10	50	400 W	24	7	52	3,494	
Vestibule - 106	1	Enclosed/Gasketed Lampholder, 1-200W/A Lamp	200 W	Breaker	59	10	200 W	24	7	52	1,747	
PT Service Room - 107	4	Pendent High-Bay HID, 1-250W/HPS Lamp	300 W	Local Switch	50	50	1,200 W	24	7	52	10,483	
	1	Pendent High-Bay Incandescent, 1-200W/A Lamp	200 W		50	50	200 W	24	7	52	1,747	
Mechanical Equipment- 108	2	Pendent High-Bay HID, 1-250W/HPS Lamp	300 W	Local Switch	50	50	600 W	24	7	52	5,242	
	1	Pendent High-Bay Incandescent, 1-200W/A Lamp	200 W		50	50	200 W	24	7	52	1,747	

LIGHTING EQUIPMENT LIST FOR: HELSTF - TEST CELL 1 October 10 - 13, 1995												
AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Optics Electronics Room - 109	21	4' Surface Industrial Fluorescent, Standard Ballast, 3-F40/T12/RS/CW Lamps	151 W	Local Switch	40	50	3,171 W	24	7	52	27,702	
	4	4' Surface Industrial Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	40	50	384 W	24	7	52	3,355	
Elevator Vestibule - 110	2	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	22	10	192 W	24	7	52	1,677	
Stairs	6	1'x4' Wall Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamp	96 W	Local Switches	15	15	576 W	24	7	52	5,032	
Electronics Equipment Room - 201	6	Pendent High-Bay HID, 1-250W/HPS Lamp	300 W	Local Switches	88	50	1,800 W	24	7	52	15,725	
	2	Pendent High-Bay Incandescent, 1-200W/A Lamp	200 W	Local Switch	88	50	400 W	24	7	52	3,494	
Mechanical Room - 203	4	Pendent High-Bay HID, 1-250W/HPS Lamp	300 W	Local Switch	30	15	1,200 W	24	7	52	10,483	
	2	Pendent High-Bay HID, 1-400W/HPS Lamp	460 W	Local Switch	30	15	920 W	24	7	52	8,037	
	4	Pendent High-Bay Incandescent, 1-200W/A Lamp	200 W	Local Switch	30	15	800 W	24	7	52	6,989	

LIGHTING EQUIPMENT LIST FOR: HELSTF - TEST CELL 1

October 10 - 13, 1995

AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
P.T. Tower - 204	10	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	6	30	960 W	24	7	52	8,387	
	4	Lampholder, 1-100W/A Lamp	100 W	Local Switch	6	30	400 W	24	7	52	3,494	
Elevator Vestibule - 205	2	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	20	10	192 W	24	7	52	1,677	
	12	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	23	30	1,152 W	24	7	52	10,064	
Elevator Vestibule - 302	2	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	20	10	192 W	24	7	52	1,677	
	11	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	40	30	1,056 W	24	7	52	9,225	
Elevator Vestibule - 402	2	1'x4' Surface Wraparound Fluorescent, Standard Ballast, 2-F40/T12/RS/CW Lamps	96 W	Local Switch	20	10	192 W	24	7	52	1,677	
	4	2'x4' Surface Fluorescent Wraparound, Standard Ballast, 4-F40/T12/RS/CW Lamps	192 W	Local Switch	50	50	768 W	24	7	52	6,709	
P.T. Tower - 501	4	Wall HID, 1-400W/HPS Lamp	460 W	Local Switch	Open	30	1,840 W	24	7	52	16,074	
Building Exterior	6	Wall Incandescent, 1-150W/HPS Lamp	150 W	Photocell	N/A	N/A	900 W	12	7	52	3,931	

LIGHTING EQUIPMENT LIST FOR: HELSTF - TEST CELL 1												
October 10 - 13, 1995												
AREA SERVED	QTY.	FIXTURE DESCRIPTION	FIXTURE LOAD	CONTROL	ACTUAL FC	CoE FC	AREA LOAD	OPER. TIMES			ANNUAL	
								HRS	DAYS	WKS	KWH	MCF
Building Exterior	11	Wall HID, 1-150W/HPS Lamp	200 W	Photocell	N/A	N/A	2,200 W	12	7	52	9,610	
Building Exterior	6	Wall HID, 1-70W/HPS Lamp	95 W	Photocell	N/A	N/A	570 W	12	7	52	2,490	
Exits	22	Wall Exit Sign, Incandescent Lamps	25 W	Breaker	N/A	N/A	550 W	24	7	52	4,805	
TOTAL ENERGY USE							62,571 W				530,590	0



## BUILDING DESCRIPTION

NAME: Test Cell 2 (TC-2)

USE: Central thermal energy plant for test cell area buildings.

GROSS AREA (SQ.FT.): 5,133      STORIES: 2      DATE OF SURVEY: 10/10/95

DATE OF CONSTRUCTION: 1982

STRUCTURE: Steel and masonry.

EXTERIOR WALLS: Concrete masonry units

ROOF: Flat built-up roof with 6" rigid insulation.

FLOOR CONSTRUCTION: 6" concrete slab on grade.

FLOOR FINISH: Sealed concrete.

CEILINGS: Open beams.

WINDOWS: None.

COOLING EQUIP: None.

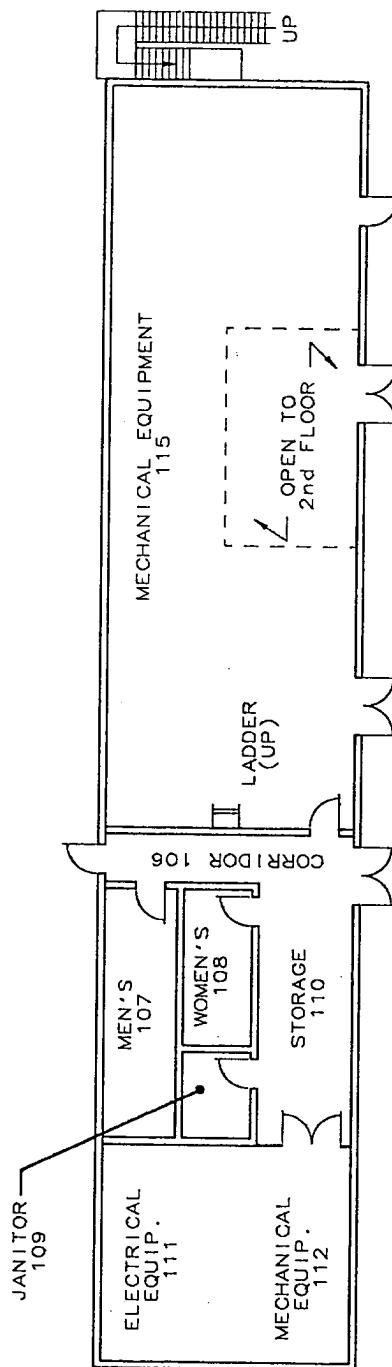
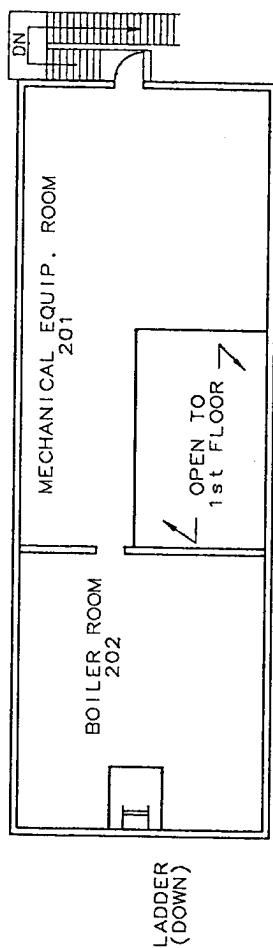
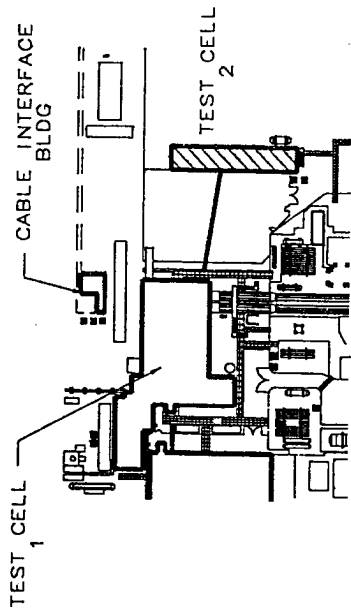
HEATING EQUIP: None.

LIGHTING: Mostly high pressure sodium fixtures with some fluorescent lighting in areas.

DOMESTIC WATER HEATING: Small residential electric water heater for restrooms only.

OTHER: Central chiller and boiler equipment, see HVAC Equipment List for descriptions. Also houses process water production equipment which is operated periodically.

REMARKS: This building is included in the study because the central plant equipment inside is used to serve the heating and cooling requirements of Test Cell 1. Therefore, only ECOs which are related to this central plant equipment will be considered in the study.



**HVAC EQUIPMENT LIST FOR: HELSTF Facility, Test Cell #2**  
January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATION TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
Water Chiller CH - 51	1	York OT A2A1B1-OGB LTJ compr. , R-11, 150.8 tons 25% ethylene glycol sol.	chilled water TC-1 building	141.0 KW	by computer model			486,281	
Water Chiller CH - 52	1	York OT A2A1B1-OGB LTH compr. , R-11, 150.8 tons 25% ethylene glycol sol.	chilled water TC-1 building	141.0 KW	by computer model			0	
Pump P-51 Chilled Water	1	Lincoln 40 hp 410 gpm, 200 ' hd	chilled water CH-51	27.3 KW	by computer model			239,148	
Pump P-52 Chilled Water	1	Lincoln 40 hp 410 gpm, 200 ' hd	chilled water CH-52	28.7 KW	by computer model			0	
Pump P-60 Condenser Water	1	U.S. Electric motor 15 hp 525 gpm, 70' hd	condenser water CH-51	13.2 KW	by computer model			115,632	
Pump P-61 Condenser Water	1	Leeson 15 hp 525 gpm, 70' hd	condenser water CH-52	10.5 KW	by computer model			0	
Pump P-63 Heating Water	1	U.S. Electric Motor 7.5 HP 80 gpm, 110' hd	heating water TC-1 building	6.4 KW	by computer model			56,064	
Pump P-64 Heating Water	1	U.S. Electric Motor 7.5 HP 80 gpm, 110' hd	heating water TC-1 building	7.2 KW	by computer model			0	
Pump P-65 Condenser Water	1	Vertical Turbine 30 hp, 1st in cycle 1425 gpm, 60' hd	condenser water CT-51AB	22.3 KW	by computer model			195,348	
Pump P-66 Condenser Water	1	Vertical Turbine 30 hp, 2nd in cycle 1425 gpm, 60' hd	condenser water CT-51AB	22.3 KW	by computer model			0	
Pump P-70 Heating Water	1	Reliance Motor 3 HP 80 gpm, 60' hd	heating water B-51	2.7 KW	by computer model			23,652	
Pump P-71 Heating Water	1	Reliance Motor 3 HP 80 gpm, 60' hd	heating water B-52	2.7 KW	by computer model			0	

**HVAC EQUIPMENT LIST FOR: HELSTF Facility, Test Cell #2**  
January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATION TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
Cooling Tower Fan CT-51A	1	BAC model CFT-2420C	condenser water CH-51	5.3 KW	by computer model			30,475	
Cooling Tower Fan CT-51B	1	BAC model CFT-2420C	condenser water CH-52	5.3 KW	by computer model			0	
Hot Water Boiler B-51	1	Weil - Mclain model 786 forced draft firebox 1104 MBH out	heating water TC-1 building	12.15 GPH 0.82 KVA-475V	by computer model				18,771
Hot Water Boiler B-52	1	Weil - Mclain model 786 forced draft firebox 1104 MBH out	heating water TC-1 building	12.15 GPH 0.82 KVA-475V	by computer model				0
Heat Exchanger HX-54	1	B & G WU-125-43, 80 gpm tube- 150 F in, 180 F out, bldg. shell- 220 F in, 190 F out, boiler	heating water B-51, B-52	0 GPH	by computer model				0
Air Compressor AC - 1	1	Sullair model 12B - 60 125 psig max. 2nd on line	Test Cell 1 & 2	50.0 A 475.0 V - 3 ph. 41.1 KVA	4	7	52	59,842	
Air Compressor AC - 2	1	Sullair model 12B - 60 125 psig max. 1st on line	Test Cell 1 & 2	61.0 A 475.0 V - 3 ph. 50.2 KVA	8	7	52	146,182	
Air Compressor AC - 51	1	Ingersol Rand 240 scfm 150 HP	Test Cell 1 & 2 Stand-by	N/A A N/A V - 3 ph. N/A KVA	0	0	0	0	
Air Compressor AC - 52	1	Ingersol Rand 240 scfm 150 HP	Test Cell 1 & 2 Stand-by	N/A A N/A V - 3 ph. N/A KVA	0	0	0	0	
Air Dryer	1	Pioneer model PH1 - 500 500 scfm 100 psig	AC-1 & AC-2	7.5 A 475.0 V - 3 ph. 6.2 KVA	4	7	52	9,027	
Air Dryer	1	Pall model 400DHA4-4000BS	AC-51 & AC-52	N/A A N/A V - 3 ph. N/A KVA	0	0	0	0	
Hot Water Unit Heater UH - 54	1	Horizontal 1000 cfm	Test Cell # 2	N/A HP	0	0	0	0	0

HVAC EQUIPMENT LIST FOR: HELSTF Facility, Test Cell #2  
January 2, 1996

ITEM	QTY.	DESCRIPTION	AREA SERVED	FULL LOAD	OPERATION TIMES			ANNUAL USE	
					HRS	DAYS	WKS	KWH	GAL
Evap. Cooler EC-51	1	4000 cfm	Test Cell # 2	1.6 KW	24	7	26	6,989	
Water Heater WH-51 Electric	1	A.O. Smith model DSE-20-6 15 gallon	Test Cell # 2 restrooms	6 KW	2	7	52	4,368	
TOTAL HEATING								0	18,771
TOTAL COOLING								516,756	
TOTAL DHW								4,368	
TOTAL FANS								6,989	
TOTAL PUMPS								629,844	
TOTAL MISC.								215,051	

MOTOR LIST FOR: HELSTF - TEST CELL #2													
DATE SURVEYED: October 10 - 13, 1995													
ITEM	QTY	DESCRIPTION	AREA SERVED	HP	PHASE	NAMEPLATE			EFF	ACTUAL		% LOAD	KW DEMAND
						VOLTS	AMPS	PF		VOLTS	AMPS		
CT-51A	1	Cooling Tower	CH-51 & CH-52	7.5	3	460	11.0	0.830	76.9%	460	8.0	72.7%	5.3
CT-51B	1	Cooling Tower	CH-51 & CH-52	7.5	3	460	11.0	0.830	76.9%	460	8.0	72.7%	5.3
P-51	1	Chilled Water Pump	CH-51	40	3	460	50.0	0.830	90.2%	475	40.0	80.0%	27.3
P-52	1	Chilled Water Pump	CH-52	40	3	460	50.0	0.830	90.2%	475	42.0	84.0%	28.7
P-60	1	Condenser Water Pump	CH-51	15	3	460	21.0	0.764	87.5%	475	21.0	100.0%	13.2
P-61	1	Condenser Water Pump	CH-52	15	3	460	18.5	0.850	92.4%	475	15.0	81.1%	10.5
P-63	1	Heating Water Pump	B-51	7.5	3	460	10.0	0.821	85.5%	475	9.5	95.0%	6.4
P-64	1	Heating Water Pump	B-52	7.5	3	460	10.3	0.797	85.5%	475	11.0	106.8%	7.2
P-65	1	Condenser Water Pump	CT-51A/B	30	3	460	38.6	0.822	88.5%	460	34.0	88.1%	22.3
P-66	1	Condenser Water Pump	CT-51A/B	30	3	460	38.6	0.822	88.5%	460	34.0	88.1%	22.3
P-70	1	Heating Water Pump	B-51	3	3	460	4.6	0.835	73.1%	475	4.0	87.0%	2.7
P-71	1	Heating Water Pump	B-52	3	3	460	4.6	0.835	73.1%	475	4.0	87.0%	2.7
TOTAL								0.821					153.9
													187.5

# APPENDIX G COMPUTER MODELING OF BUILDING SYSTEMS

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## APPENDIX G

### COMPUTER MODELING OF BUILDING SYSTEMS

- A. General Parameters. The following assumptions and estimates were used in the modeling of the existing building systems included in this study.
1. The Trace 600 weather data for Holloman AFB, New Mexico was used in all of the computer simulations.
  2. The Trace 600 computer simulations were performed for the months of January through December to determine annual lighting and HVAC equipment energy consumptions.
  3. The Trace 600 default calendar and holiday schedules were used for this model. The holiday schedule includes the seven standard holidays: New Years Day, President's Day, Memorial Day, Fourth of July, Labor Day, Thanksgiving, and Christmas.
  4. All building dimensions and construction data were determined from as-built drawings when available, or from field measurements taken during the site visit.
  5. Design room temperatures (thermostat setpoints) were obtained from CEMP-E (9 December 1991) Chapter 13, Section 3. These temperatures were 75°F for cooling in comfort conditions, 70°F, 45% or 50% relative humidity for cooling in areas housing computer type equipment, and 70°F for heating.
  6. The number of people in each building or room was estimated from field notes taken during the site visit. The sensible and latent heat gain rates used for the people in each room were taken from ASHRAE data.
  7. Building and room lighting loads were obtained from as-built drawings when available, or from field notes taken during the site visit.
  8. Building and room miscellaneous equipment loads were estimated from field notes taken during the site visit. These loads represent the internal heat gains generated from equipment in the rooms, such as computers, office equipment, test equipment, etc. Heat gain data for the various types of internal loads was taken from ASHRAE or estimated from the power supplied by the Uninterruptible Power Source (UPS) feeders, which was measured during the site visit.
  9. It was assumed that ½ of the equipment being served by the UPS feeders was operating at the time that the amperes and voltage were measured on the system, and this was assumed typical for all times other than testing periods.
  10. For all building areas with forced ventilation, the rates were taken from schedule data on the existing air handlers. Data from ASHRAE Standard 62-1989 was used to verify ventilation requirements and implemented, where applicable, in the analysis for proposed ECO's.
  11. Building and room exhaust rates were taken from as-built drawings.
  12. Lighting operational times were estimated from field notes taken during the site visit.
  13. The exterior walls and portions of the roof which are below grade in the LSTC building were modeled as partitions with a constant adjacent space temperature. These soil temperatures were



obtained from The International Ground Source Heat Pump Association (IGSHPA) for the areas surrounding Roswell, N.M.

14. The U-value for the exterior walls, roof, and domes of the LSTC building was estimated at 0.18 BTUH/sqft/°F for a masonry wall of 24" concrete.
15. The ballast factor for all fluorescent fixtures was included in the power supplied to each fixture rather than a separate input into TRACE 600.
16. No cooling or heating temperature setback controls were included in the simulations for the existing conditions, as none are currently in place.

B. People, Lights and Miscellaneous Equipment Schedules. The following assumptions and estimates were used in the modeling of the existing LSTC and TC-1 buildings included in this study.

1. In modeling the existing building operation, all people were scheduled at 100% from 7 am until 12 pm, and from 1 pm until 4 pm during the weekdays. During the lunch hour, from 12 pm until 1 pm, all people were scheduled at 10%. On the weekends and holidays, all people were scheduled at 0%.
2. In modeling the proposed variable air volume system for the LSTC building (ECO-D), the number of people in a particular zone at any one time varied to more accurately account for the change in load that actually occurs during the period of a day. Three separate schedules, all with the same amount of total occupied hours for the people, were used to simulate people entering and leaving the zone during the day. For example, all people for a particular zone were scheduled at 100% from 7am to 9 am, 10 am to 12 pm, 1 pm to 2 pm, and 3 pm to 4 pm. At other times, besides the lunch hour, during the hours of 7 am to 4 pm, the people were scheduled at 50 %. During the lunch hour, all people were scheduled at 10%. All other times the people were scheduled at 0%.
3. Several schedules were used to simulate the existing and proposed operation of the interior lighting in the buildings. In all cases, the lights were scheduled at 100% from 7am until 4 pm. The schedules then differed according to the unoccupied building hours between 4 pm to 7am. Typically, the lights were scheduled at 100%, 75%, 50%, 40%, 25%, 10% , or 0% for the unoccupied times, according to existing or proposed conditions.
4. All miscellaneous equipment that is used for normal day to day operation (personal computers, copiers, fax machines, etc.) was scheduled at 100% from 7 am until 4 pm. On the weekends and holidays, all equipment was scheduled at 0%.
5. All electronic equipment used for laser systems testing in the LSTC and TC-1 buildings are powered through UPS systems. The main electrical feeders to these two UPS systems were measured to determine the power consumption of this electronic equipment. It was assumed that approximately 50% of the total equipment was on during the power measurements, and that this is the equipment left on year round. The other 50% of the electronic equipment was assumed to be turned on only during the infrequent testing. The computer simulations approximated these conditions.

C. HVAC Equipment Schedules. The following assumptions and estimates were used in the modeling of the existing buildings included in this study.

1. All air handler fans, cooling coils, and heating coils were scheduled to operate 100% of the day, 12 months of the year, as required by room thermostats to maintain building setpoint temperatures.
2. All building infiltration and ventilation air is scheduled to be introduced into the buildings at a fixed rate 100% of the day, 12 months per year.
3. All building and room thermostats were scheduled to maintain the design setpoints 24 hours per day, 12 months per year with no setback periods.

D. Building HVAC Systems. The following assumptions and estimates were used in the modeling of the existing building HVAC systems included in this study.

1. HVAC air system types were taken from building as-built drawings when available, or from field notes taken during the site visit.
2. Buildings were zoned as shown on as-built drawings and served by individual HVAC air systems in order to generate a more realistic load profile for the boilers and chillers.
3. The controls for all of the primary and secondary equipment was modeled as indicated on the as-built control drawings for each piece of equipment, and from recorded measurements obtained from base personnel.
4. In order to simplify the model, similarly loaded rooms that were served by the same AHU were combined and modeled as one room.
5. With the exception of ESH-53, the original building humidification equipment was not modeled because it has all been disconnected.
6. Some areas were served by both computer room units and central air systems. In order to simplify the model, the computer room units were modeled to handle the computer room equipment load while the other AHU serving the space conditioned the remainder of the loads.
7. Forward curved fans were used in modeling all of the air handling units.
8. ECO-C (Install EMS Systems) involved the repair or retrofit of the existing controls for the air systems. To simplify the analysis, there were four control strategies that were proposed in the model. The following are a list of the proposed air system control strategies:

Cold deck reset: the CHW coil is modulated to maintain minimum reheat or cooling coil bypass according to the fluctuation of space (zone) temperatures.

Optimum Start/Stop (LSTC only): the air system fan is energized at a certain time before occupancy which is calculated by multiplying the number of minutes required to change the space temperature one degree by the number of degrees away from the space temperature setpoint.

Outside Air Economizer: When the ambient temperature falls below 65°F, the OA, return, and

exhaust dampers are modulated between a maximum OA intake and the minimum required for IAQ standards to maintain a mixed air temperature setpoint.

Outside Air scheduling (TC-1 only): At periods of 0% occupancy, OA supply will be 0%.

E. Boiler & Chiller Systems. The following assumptions and estimates were used in the modeling of the boiler and chiller systems included in this study.

1. Boiler and chiller systems types, full load capacity, and energy consumption were identified during the field inspection and used in the computer simulations for modeling the existing equipment. The Trace 600 models were used for part load performance of these boilers and chillers.
2. The chillers serving the LSTC building were modeled with a double bundle heat recovery condenser section that supplies heating water at 95°F to reheat coils.
3. It was assumed that all existing chillers had a full load KW/ton increase of 1% over their original rating for each year of service up to ten years. For all service over ten years, 0.25% per year was added to the full load KW/ton rating. This was done to account for natural efficiency losses due to tube fouling and compressor wear.
4. It was assumed that all existing boilers had a full load efficiency decrease of 1% under their original rating for each year of service up to ten years. For all service over ten years, 0.25% per year was deducted from the full load efficiency rating. This was done to account for natural efficiency losses due to tube fouling and burner wear.
5. New pumps were selected for all proposed boilers and chillers when required and input to simulate the new systems.
6. Existing cooling tower types and their fan horsepowers were identified during the field inspection and used in the existing and proposed computer simulations.
7. In all areas, a base load was estimated and added to the existing and proposed chillers and boilers to account for heat loss or gain from piping insulation and pumps. This base load increased the required capacity of the boilers and chillers and shows up as 'base utility' in the equipment energy consumption output sheets.
8. The age of the equipment, if not available from as-built drawings, was estimated from field notes taken during the site visit.
9. The evaporative coolers serving the unconditioned areas in Test Cell #1 were not modeled because the only energy consumed by these units is the fractional HP pump and fan.
10. New boiler and chiller alternatives were selected for the ECO evaluations. Full load capacity and energy consumption rates were obtained from manufacturer's data and input into the computer simulations. Part load energy consumption data was modeled using Trace 600 part load curves for similar equipment.
11. All proposed chillers were selected from the top 25% of their class in terms of efficiency (KW/ton), and also were at least 10% more efficient than current design standards.
12. For ECO-C (Install EMS Systems), the boiler and chiller equipment was modeled with new

control strategies as applicable. The following are a list of the water system control strategies used in the computer models:

Chiller Sequencing: In areas where more than one chiller was selected to handle the cooling load, chiller sequencing was modeled to obtain the optimum efficiency at all part load conditions. This also required selecting the chillers to operate at the best efficiency points for the greatest percentage of operation time.

CHW/HW Temperature Reset: The chilled/heating water supply temperature was reset according to the part load ratio of the chiller/boiler. At 80% part load, the chilled/heating water supply temperature was reset to 2°F above/below design temperature. At 40% part load, the chilled/heating water temperature was reset to a maximum value of 4°F above/below design temperature.

CND Water Reset (TC-1 only): Whenever possible, the condenser water supply temperature is reset to a temperature below 85°F to decrease the amount of work that the compressor is required to accomplish.

13. The chillers and boilers in TC-2 serve other equipment besides TC-1. These other loads, including piping and pumping heat input and losses, were estimated from field notes or as-built drawings and input as a base load on the chillers and boilers.

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01 1 - Job Information

Project: EEAP ENERGY STUDY - HELSTF  
 Location: WHITE SANDS - ALAMOGORDO, NEW MEXICO  
 Client: FORT WORTH CORPS OF ENGINEERS  
 Program User: HUITT-ZOLLARS, INC.  
 Comments: LSTC BUILDING

**EXISTING LSTC BUILDING**

Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
HOLLOMAN								

----- Load Section Alternative #1 -----

Card 19- Load Alternative -

Number	Description
1	EXISTING BUILDING

Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
5	1	B-17 B,C,& D	25.5	59.5	10	2		10			
10	2	B-17,18,AEROBICS	59	59.5	10	2		10			
15	3	B-8,16,27-32	80.5	80.5	10	2		10			
20	4	B-25,25A	22	15	10	2		10			
25	5	B-4	27	27.5	10	2		10			
30	6	B-12,12A	55.5	55.5	10	2		10			
35	7	B-2,13,19,20-22	45.5	45.5	10	2		10			
40	8	B-1,3,24	81	81	10	2		10			
45	9	B-9,10,11,11A	111.5	20	10	2		10			
50	10	DOMES,MAIN WINGS	40	40.5	10	2		10			
55	11	SW LOWER DOME	48	48	10	2		10			
60	12	NE LOWER DOME	48	48	10	2		10			
65	13	MAIN FLR WEST	89.5	37	10	2		10			
70	14	MAIN FLR EAST	61	61	10	2		10			
75	15	112,119A,123A,	94.5	95	10	2		10			
80	16	MAIN FLOOR CENTR	93	93.5	10	2		10			
85	17	MAIN FLOOR SOUTH	51	51	10	2		10			

Card 20----- General Room Parameters -----											
Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Number	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
		Descript					Resistance	Height	Multiplier	Zone	
90	18	L.DOME COMP. RMS.	63.5	63.5	10	2		10			
95	19	L.DOME OFFICES	71	71	10	2		10			
100	20	U.DOME	88.5	88.5	10	2		10			
105	21	RM 119, AH-8	1	1							
110	22	RM 119A, AH-9	1	1							
115	23	RM 123, AH-10	1	1							
120	24	RM 127A, AH-11A	1	1							
125	25	RM 127A, AH-11B	1	1							
130	26	RM 127, AH-12	1	1							
135	27	AUX CNTRL, AH-14	1	1							
140	28	RM 110 UNDERFLOR	33	34	10	2		10			
145	29	RM 120A,122,126A	50	50	10	2		10			
150	30	RM 146A,148,148A	32	32	10	2		10			
155	31	204,205,206,207	63.5	63.5	10	2		10			

Card 21----- Thermostat Parameters -----											
Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet	
Number	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On	
	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor	
5	75	50	75		70	70			HEAVY130	NO	
10	75	50	75		70	70			HEAVY130	NO	
15	75	50	75		70	70			HEAVY130	NO	
20	75	50	75		70	70			HEAVY130	NO	
25	75	50	75		70	70			HEAVY130	NO	
30	75	50	75		70	70			HEAVY130	NO	
35	75	50	75		70	70			HEAVY130	NO	
40	75	50	75		70	70			HEAVY130	NO	
45	70	45	70		70	70			HEAVY130	NO	
50	75	50	75		70	70			HEAVY130	NO	
55	75	50	75		70	70			HEAVY130	NO	
60	75	50	75		70	70			HEAVY130	NO	
65	75	50	75		70	70			HEAVY130	NO	
70	75	50	75		70	70			HEAVY130	NO	
75	75	50	75		70	70			HEAVY130	NO	
80	70	45	70		70	70			HEAVY130	NO	
85	75	50	75		70	70			HEAVY130	NO	
90	70	45	70		70	70			HEAVY130	NO	
95	75	50	75		70	70			HEAVY130	NO	
100	75	50	75		70	70			HEAVY130	NO	
105	70	45	70		70	70					
110	70	45	70		70	70					
115	70	45	70		70	70					
120	70	45	70		70	70					
125	70	45	70		70	70					
130	70	45	70		70	70					

Card 21----- Thermostat Parameters -----										
Room Number	Cooling Room Design DB	Room RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	Heating T'stat Location Flag	T'stat No. Hrs Average	Mass / Carpet On Floor
135	70	45	70		70	70				
140	70	45	70		70	70				
145	70	45	70		70	70				
150	70	45	70		70	70				
155	70	45	70		70	70				

Card 22----- Roof Parameters -----									
Room Number	Roof Number	Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
50	1	YES			0.18	19			.4
100	1	NO	88	88	0.18	19			.4

Card 24----- Wall Parameters -----									
Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
50	1	26.5	31	0.18	94	0		.4	
50	2	26.5	31	0.18	94	90		.4	
50	3	26.5	31	0.18	94	180		.4	
50	4	26.5	31	0.18	94	270		.4	
55	1	42	15	0.18	94	0		.4	
55	2	42	15	0.18	94	90		.4	
55	3	42	15	0.18	94	180		.4	
55	4	42	15	0.18	94	270		.4	
60	1	42	15	0.18	94	0		.4	
60	2	42	15	0.18	94	90		.4	
60	3	42	15	0.18	94	180		.4	
60	4	42	15	0.18	94	270		.4	
90	1	37.5	10	0.18	94	0		.4	
90	2	37.5	10	0.18	94	90		.4	
90	3	37.5	10	0.18	94	180		.4	
90	4	37.5	10	0.18	94	270		.4	
95	1	47	10	0.18	94	0		.4	
95	2	47.5	10	0.18	94	90		.4	
95	3	47	10	0.18	94	180		.4	
95	4	47.5	10	0.18	94	270		.4	
100	1	78	29	0.18	94	0		.4	
100	2	78.5	29	0.18	94	90		.4	
100	3	78	29	0.18	94	180		.4	
100	4	78.5	29	0.18	94	270		.4	



Card 26----- Schedules -----										
Room					Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number	People	Lights	Ventilation	Infiltration	Minimum	Fans	Fan	Fan	Exhaust	Controls
5	OFFICEP1	OFICEL25								
10	OFFICEP1	OFICEL26								
15	OFFICEP1	CLGONLY								
20		CLGONLY								
25		CLGONLY								
30	OFFICEP1	CLGONLY								
35	OFFICEP1	CLGONLY								
40		CLGONLY								
45	OFFICEP1	CLGONLY								
50	OFFICEP1	CLGONLY								
55	OFFICEP1	CLGONLY								
60	OFFICEP1	CLGONLY								
65	OFFICEP1	OFICEL27								
70	OFFICEP1	OFFICEL6								
75	OFFICEP1	CLGONLY								
80	OFFICEP1	OFICEL28								
85	OFFICEP1	OFFICEL2								
90	OFFICEP1	CLGONLY								
95	OFFICEP1	OFICEL29								
100	OFFICEP1	CLGONLY								
105	CLGONLY									
110	CLGONLY									
115	CLGONLY									
120	CLGONLY									
125	CLGONLY									
130	CLGONLY									
135	CLGONLY									
140	CLGONLY									

Card 27----- People and Lights -----												
Room	People	People	People	People	Lighting	Lighting	Lighting	Percent	--- Daylighting ---			
Number	Value	Units	Sensible	Latent	Value	Units	Fixture Type	Ballast Factor	Lights to Ret. Air	Reference Point 1	Reference Point 2	
5	7	PEOPLE	250	200	2880	WATTS	ASHRAE1					
10	3	PEOPLE	250	200	5311	WATTS	SUSFLUOR					
15	2	PEOPLE	250	200	11728	WATTS	SUSFLUOR					
20					576	WATTS	SUSFLUOR					
25					3193	WATTS	SUSFLUOR					
30	2	PEOPLE	250	200	4128	WATTS	ASHRAE1					
35					1728	WATTS	ASHRAE1					
40					5664	WATTS	ASHRAE1					
45	3	PEOPLE	250	200	8064	WATTS	ASHRAE1					
50	1	PEOPLE	250	200	576	WATTS	ASHRAE1					
55	1	PEOPLE	250	200	4416	WATTS	ASHRAE1					
60	3	PEOPLE	250	200	4983	WATTS	ASHRAE1					
65	7	PEOPLE	250	200	9175	WATTS	SUSFLUOR					
70	13	PEOPLE	250	200	5568	WATTS	ASHRAE1					
75	15	PEOPLE	250	200	22272	WATTS	ASHRAE1					

Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---	
										Reference. Point 1	Reference Point 2
80	12	PEOPLE	250	200	19104	WATTS	ASHRAE1				
85	11	PEOPLE	250	200	7008	WATTS	ASHRAE1				
90	16	PEOPLE	250	200	8310	WATTS	ASHRAE1				
95	18	PEOPLE	250	200	10284	WATTS	ASHRAE1				
100	19	PEOPLE	250	200	16416	WATTS	ASHRAE1				
105	1	PEOPLE	250	200							
110	1	PEOPLE	250	200							
115	1	PEOPLE	250	200							
120	1	PEOPLE	250	200							
125	1	PEOPLE	250	200							
130	1	PEOPLE	250	200							
135	4	PEOPLE	250	200							
140	1	PEOPLE	250	200							

Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
5	1	TYP. OFFICE EQ.	8500	WATTS	OFFICEL1						
10	1	TYP. OFFICE EQ.	1430	WATTS	OFFICEL1						
15	1	TYP. OFFICE EQ.	13814	WATTS	CLGONLY						
20	1	ELEV. MOTOR	6230	WATTS	CLGONLY						
30	1	OFFICE, LIGHT EQ	4636	WATTS	OFFICEL1						
40	1	MISC. EQ.	13132	WATTS	CLGONLY						
45	1	TYP OFFICE EQ	4250	WATTS	OFFICEL1						
55	1	TYP OFFICE EQ	830	WATTS	OFFICEL1						
60	1	TYP OFFICE EQ	7140	WATTS	OFFICEL1						
65	1	TYP OFFICE EQ	9040	WATTS	OFFICEL1						
70	1	TYP OFFICE EQ	12445	WATTS	OFFICEL1						
85	1	TYP OFFICE EQ	9220	WATTS	OFFICEL1						
90	1	TYP OFFICE EQ	4980	WATTS	CLGONLY						
95	1	TYP OFFICE EQ	23580	WATTS	OFFICEL1						
100	1	MISC. OFFICE EQ	32541	WATTS	OFFICEL2						
105	1	COMPUTERS - UPS	5995	WATTS	OFFICEM1	ELEC					
110	1	COMPUTERS - UPS	7194	WATTS	OFFICEM1	ELEC					
115	1	COMPUTERS - UPS	4700	WATTS	OFFICEM1	ELEC					
120	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC					
125	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC					
130	1	COMPUTERS - UPS	7320	WATTS	OFFICEM1	ELEC					
135	1	COMPUTERS - UPS	2214	WATTS	OFFICEM1	ELEC					
140	1	COMPUTERS - UPS	4892	WATTS	OFFICEM1	ELEC					
145	1	COMPUTERS - UPS	10978	WATTS	OFFICEM1	ELEC					
150	1	COMPUTERS - UPS	4434	WATTS	OFFICEM1	ELEC					
155	1	COMPUTERS - UPS	17545	WATTS	OFFICEM1	ELEC					

Card 29-----Room Airflows-----										
-----Ventilation-----					-----Infiltration-----					
Room		-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	163	CFM	163	CFM						
10	163	CFM	163	CFM						
15	164	CFM	164	CFM						
20	251	CFM	251	CFM						
25	251	CFM	251	CFM						
30	251	CFM	251	CFM						
35	251	CFM	251	CFM						
40	251	CFM	251	CFM						
45	800	CFM	800	CFM						
50	393	CFM	393	CFM						
55	393	CFM	393	CFM						
60	393	CFM	393	CFM						
65	393	CFM	393	CFM						
70	394	CFM	394	CFM						
75	394	CFM	394	CFM						
80	375	CFM	375	CFM						
85	375	CFM	375	CFM						
90	375	CFM	375	CFM						
95	375	CFM	375	CFM						
100	1000	CFM	1000	CFM						
135	300	CFM	300	CFM						

Card 30-----Fan Airflows-----										
-----Main-----					-----Auxiliary-----					
Room		-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Room Exhaust--
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	2675	CFM	2675	CFM						
10	3180	CFM	3180	CFM						
15	10917	CFM	10917	CFM					790	CFM
20	700	CFM	700	CFM						
25	800	CFM	800	CFM						
30	3025	CFM	3025	CFM						
35	845	CFM	845	CFM						
40	17300	CFM	17300	CFM						
45	9060	CFM	9060	CFM						
50	1100	CFM	1100	CFM						
55	1570	CFM	1570	CFM						
60	1910	CFM	1910	CFM						
65	2905	CFM	2905	CFM						
70	3075	CFM	3075	CFM						
75	6840	CFM	6840	CFM						
80	5952	CFM	5952	CFM					3769	CFM
85	2339	CFM	2339	CFM						
90	4268	CFM	4268	CFM						
95	3824	CFM	3824	CFM						
100	12518	CFM	12518	CFM						

Card 30-----Main-----					Fan Airflows -----Auxiliary-----					
Room	----Cooling----		----Heating----		----Cooling----		----Heating----		--Room Exhaust--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
105	8643	CFM	8643	CFM						
110	11962	CFM	11962	CFM						
115	4780	CFM	4780	CFM						
120	7526	CFM	7526	CFM						
125	7467	CFM	7467	CFM						
130	8800	CFM	8800	CFM						
135	11513	CFM	11513	CFM						
140	5409	CFM	5409	CFM						
145	10620	CFM	10620	CFM						
150	8893	CFM	8893	CFM						
155	23005	CFM	23005	CFM						

Card 31----- Partition Parameters -----										
Room	Partition	Partition	Partition	Partition	Const	Temp	Cooling	Heating	Adjacent	
Number	Number	Length	Height	U-Value	Type	Flag	Temp	Temp	Room No	
5	1	43	43	.18	110	CONSTANT	63	63		
10	1	68.5	68.5	.18	110	CONSTANT	63	63		
15	1	92.5	93	.18	110	CONSTANT	63	63		
20	1	26.5	26.5	0.18	110	CONSTANT	63	63		
25	1	27.5	27	0.18	110	CONSTANT	63	63		
30	1	55.5	55.5	0.18	110	CONSTANT	63	63		
35	1	64	10	0.18	110	CONSTANT	63	63		
40	1	50	10	0.18	110	CONSTANT	63	63		
45	1	111.5	10	0.18	110	CONSTANT	63	63		
60	1	45	45	0.18	110	CONSTANT	63	63		
65	1	89.5	37	0.18	110	CONSTANT	71	55		
70	1	89.5	37	0.18	110	CONSTANT	71	55		
75	1	87	87	0.18	110	CONSTANT	71	55		
85	1	60	60	0.18	110	CONSTANT	71	55		

----- System Section Alternative #1 -----

## Card 39- System Alternative

Number	Description
1	EXISTING SECONDARY EQUIPMENT AND SYSTEMS

## Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System	Ventil	Fan					
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBvh	SADBvh	Schedule	Schedule	Pressure
1	BPMZ	ROADK					.127

## Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System	Ventil						Fan
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBvh	SADBvh	Schedule	Schedule	Pressure
2	BPMZ						
3	TRH						
4	TRH						
5	TRH	ROADK					.389
6	BPMZ						
7	COMP						
8	COMP						
9	COMP						
10	COMP						
11	COMP						
12	COMP						
13	COMP						
14	TRH						

## Card 41----- Zone Assignment -----

System												
Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	3										
2	4	8										
3	9	9										
4	10	15										
5	16	19										
6	20	20										
7	21	21										
8	22	22										
9	23	23										
10	24	24										
11	25	25										
12	26	26										
13	27	27										
14	28	31										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.75						1.0				
2	1.5			.326							
3	2.4			.208							

Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
4	2.5			.613							
5	3.45					1.5					
6	2.1			.26							
7	0.92										
8	1.67										
9	0.64										
10	1.39										
11	1.54										
12	1.04										
13	1.64			.077							
14	3.25										

Card 43----- Airflow Design Temperatures -----

System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff
1					63	63				
2					63	63				
3					54	54				
4					49.5	49.5				
5					50	50				
6					62	62				
14					54	54				

Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1						OFF	OFF	OFF		
2						OFF	OFF	OFF		
6						OFF	OFF	OFF		

Card 47----- Fan Overrides -----

Sys	Clg	Htg	Ret	Mn Exh	Aux	Rm Exh	Opt Vnt	-----MAIN COOLING FAN-----			
Set	Fan	Fan	Fan	Fan	Fan	Fan	Sys Fan	Mech	Air	Air	Size
Num	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Value	Units	Meth
3											Config
4											BLOW
5											BLOW
14											BLOW

## ----- Equipment Section Alternative #1 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative Number	Elec Consump Time of Day Schedule	Elec Demand Time of Day Schedule	Demand Limit Max KW	Alternative Description	---- Demand Limit --- Temperature Schedule Drift
1				EXISTING PRIMARY EQUIPMENT	

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling	Asgn	Loads To	Equipment	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
1	1	PKPLANT	1	14										

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref Code	Of	--Capacity--	Value	Units	Value	Units	--Capacity--	Value	Units	Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	1	SER	
2	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	2	SER	

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	39.3	KW	27.5	KW					1	1
2	0	KW	18.3	KW					2	

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej		
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref	To Ref	@ HW
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type	Number	Temp
1						85	65	HEATING	1	95
2						85	65	HEATING	2	95

## Card 65----- Heating Load Assignment -----

Load	All Coil	Assignment	Loads To	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
Reference	Heating Ref											
1	1			3	5	14	14					
2	3			7	13							

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Card 67----- Heating Equipment Parameters -----												
Heat	Equip	Number	HW Pmp				Energy		Seq	Switch		Demand
Ref	Code	Of	Full Ld	Cap'y		Rate		Order	over	Hot	Misc.	Limit
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Cogen
1	EQ2002	1	0	KW			100	PCTEFF				
2	EQ2002	1	0	KW			100	PCTEFF				
3	EQ2263	1										

Card 69----- Fan Equipment Parameters -----							
System	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Set	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
Number						EQ4003	EQ4003
1	EQ4003						
2	EQ4003			EQ4003			
3	EQ4003			EQ4003			
4	EQ4003			EQ4003			
5	EQ4003					EQ4003	EQ4003
6	EQ4003			EQ4003			
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						
11	EQ4003						
12	EQ4003						
13	EQ4003			EQ4003			
14	EQ4003						

Card 70----- Fan Equipment KW Overrides -----													
-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY----					
System	Cool	Heat	Ret	Exh	Aux	Room	Opt						
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Room	Opt
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan	Fan
1	6.5							1.2	.25				
2	10.2			.652									
3	6.5			.415									
4	17.3			1.225									
5	13.9					2.7	.779						
6	7.4			.519									
7	3.3												
8	5.6												
9	1.8												
10	3.7												
11	4.7												
12	3.3												
13	5.6			.156									
14	22.7												



Card 71----- Base Utility Parameters -----									
Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
1	CHW PIPING LOSS	4.64	TONS	AVAIL	CHILL-LD	1			
2	HW PIPING LOSS	77.4	MBH	AVAIL	HOT-LD	1			

Card 74----- Condenser / Cooling Tower Parameters -----											
Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units
1	EQ5100			12.5	KW	T-WATER	CTOWER	1			
2	EQ5100			10.8	KW	T-WATER	CTOWER	1			

Card 75----- Miscellaneous Accessory -----												
#1				#2				#3				
Misc Ref	Equip Code	Energy Value	Energy Units	Sched Code	Equip Code	Energy Value	Energy Units	Sched Code	Equip Code	Energy Value	Energy Units	Sched Code
1	EQ5020	16.6	KW									

## ----- Load Section Alternative #2 -----

## Card 19- Load Alternative -

Number	Description
2	ECO A - LIGHTING FIXTURE UPGRADE

Card 20----- General Room Parameters -----												
Room Number	Zone Reference	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth	
5	1	B-17 B,C,& D	25.5	59.5	10	2		10				
10	2	B-17,18,AEROBICS	59	59.5	10	2		10				
15	3	B-8,16,27-32	80.5	80.5	10	2		10				
20	4	B-25,25A	22	15	10	2		10				
25	5	B-4	27	27.5	10	2		10				
30	6	B-12,12A	55.5	55.5	10	2		10				
35	7	B-2,13,19,20-22	45.5	45.5	10	2		10				
40	8	B-1,3,24	81	81	10	2		10				
45	9	B-9,10,11,11A	111.5	20	10	2		10				
50	10	DOMES,MAIN WINGS	40	40.5	10	2		10				
55	11	SW LOWER DOME	48	48	10	2		10				
60	12	NE LOWER DOME	48	48	10	2		10				
65	13	MAIN FLR WEST	89.5	37	10	2		10				

## ECO-A, LSTC BUILDING

Card 20----- General Room Parameters -----											
Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Ceiling Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
70	14	MAIN FLR EAST	61	61	10	2		10			
75	15	112,119A,123A,	94.5	95	10	2		10			
80	16	MAIN FLOOR CENTR	93	93.5	10	2		10			
85	17	MAIN FLOOR SOUTH	51	51	10	2		10			
90	18	L.DOME COMP. RMS.	63.5	63.5	10	2		10			
95	19	L.DOME OFFICES	71	71	10	2		10			
100	20	U.DOME	88.5	88.5	10	2		10			
105	21	RM 119, AH-8	1	1							
110	22	RM 119A, AH-9	1	1							
115	23	RM 123, AH-10	1	1							
120	24	RM 127A, AH-11A	1	1							
125	25	RM 127A, AH-11B	1	1							
130	26	RM 127, AH-12	1	1							
135	27	AUX CNTRL, AH-14	1	1							
140	28	RM 110 UNDERFLOR	33	34	10	2		10			
145	29	RM 120A,122,126A	50	50	10	2		10			
150	30	RM 146A,148,148A	32	32	10	2		10			
155	31	204,205,206,207	63.5	63.5	10	2		10			

Card 21----- Thermostat Parameters -----											
Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	Heating T'stat Location Flag	T'stat Location	Mass / No. Hrs Average	Carpet On Floor
5	75	50	75		70	70				HEAVY130	NO
10	75	50	75		70	70				HEAVY130	NO
15	75	50	75		70	70				HEAVY130	NO
20	75	50	75		70	70				HEAVY130	NO
25	75	50	75		70	70				HEAVY130	NO
30	75	50	75		70	70				HEAVY130	NO
35	75	50	75		70	70				HEAVY130	NO
40	75	50	75		70	70				HEAVY130	NO
45	70	45	70		70	70				HEAVY130	NO
50	75	50	75		70	70				HEAVY130	NO
55	75	50	75		70	70				HEAVY130	NO
60	75	50	75		70	70				HEAVY130	NO
65	75	50	75		70	70				HEAVY130	NO
70	75	50	75		70	70				HEAVY130	NO
75	75	50	75		70	70				HEAVY130	NO
80	70	45	70		70	70				HEAVY130	NO
85	75	50	75		70	70				HEAVY130	NO
90	70	45	70		70	70				HEAVY130	NO
95	75	50	75		70	70				HEAVY130	NO
100	75	50	75		70	70				HEAVY130	NO
105	70	45	70		70	70				HEAVY130	NO
110	70	45	70		70	70				HEAVY130	NO

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
115	70	45	70		70	70				
120	70	45	70		70	70				
125	70	45	70		70	70				
130	70	45	70		70	70				
135	70	45	70		70	70				
140	70	45	70		70	70				
145	70	45	70		70	70				
150	70	45	70		70	70				
155	70	45	70		70	70				

## Card 22----- Roof Parameters -----

Room	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Equal to Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
50	1	YES			0.18	19			.4
100	1	NO	88	88	0.18	19			.4

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Reflectance Multiplier
50	1	26.5	31	0.18	94	0		.4	
50	2	26.5	31	0.18	94	90		.4	
50	3	26.5	31	0.18	94	180		.4	
50	4	26.5	31	0.18	94	270		.4	
55	1	42	15	0.18	94	0		.4	
55	2	42	15	0.18	94	90		.4	
55	3	42	15	0.18	94	180		.4	
55	4	42	15	0.18	94	270		.4	
60	1	42	15	0.18	94	0		.4	
60	2	42	15	0.18	94	90		.4	
60	3	42	15	0.18	94	180		.4	
60	4	42	15	0.18	94	270		.4	
90	1	37.5	10	0.18	94	0		.4	
90	2	37.5	10	0.18	94	90		.4	
90	3	37.5	10	0.18	94	180		.4	
90	4	37.5	10	0.18	94	270		.4	
95	1	47	10	0.18	94	0		.4	
95	2	47.5	10	0.18	94	90		.4	
95	3	47	10	0.18	94	180		.4	
95	4	47.5	10	0.18	94	270		.4	
100	1	78	29	0.18	94	0		.4	
100	2	78.5	29	0.18	94	90		.4	

Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Constuc	Direction	Tilt	Alpha	Reflectance
100	3	78	29	0.18	94	180		.4	
100	4	78.5	29	0.18	94	270		.4	

Card 26----- Schedules -----

Room	People	Lights	Ventilation	Infiltration	Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number					Minimum	Fans	Fan	Fan	Exhaust	Controls
5	OFFICEP1	OFICEL25								
10	OFFICEP1	OFICEL26								
15	OFFICEP1	CLGONLY								
20		CLGONLY								
25		CLGONLY								
30	OFFICEP1	CLGONLY								
35	OFFICEP1	CLGONLY								
40		CLGONLY								
45	OFFICEP1	CLGONLY								
50	OFFICEP1	CLGONLY								
55	OFFICEP1	CLGONLY								
60	OFFICEP1	CLGONLY								
65	OFFICEP1	OFICEL27								
70	OFFICEP1	OFFICEL6								
75	OFFICEP1	CLGONLY								
80	OFFICEP1	OFICEL28								
85	OFFICEP1	OFFICEL2								
90	OFFICEP1	CLGONLY								
95	OFFICEP1	OFICEL29								
100	OFFICEP1	CLGONLY								
105	CLGONLY									
110	CLGONLY									
115	CLGONLY									
120	CLGONLY									
125	CLGONLY									
130	CLGONLY									
135	CLGONLY									
140	CLGONLY									

Card 27----- People and Lights -----

Room	People	People	People	People	Lighting	Lighting	Lighting	Ballast	Percent	--- Daylighting ---
Number	Value	Units	Sensible	Latent	Value	Units	Fixture	Factor	Lights to	Reference
5	7	PEOPLE	250	200	1876	WATTS	ASHRAE1		Ret. Air	Point 1
10	3	PEOPLE	250	200	3263	WATTS	SUSFLUOR			Point 2
15	2	PEOPLE	250	200	7204	WATTS	SUSFLUOR			
20					375	WATTS	SUSFLUOR			

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Card 27----- People and Lights -----											
Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting --- Reference Point 1	Reference Point 2
25					2060	WATTS	SUSFLUOR				
30	2	PEOPLE	250	200	2683	WATTS	ASHRAE1				
35					1115	WATTS	ASHRAE1				
40					3683	WATTS	ASHRAE1				
45	3	PEOPLE	250	200	4838	WATTS	ASHRAE1				
50	1	PEOPLE	250	200	374	WATTS	ASHRAE1				
55	1	PEOPLE	250	200	2870	WATTS	ASHRAE1				
60	3	PEOPLE	250	200	3024	WATTS	ASHRAE1				
65	7	PEOPLE	250	200	5967	WATTS	SUSFLUOR				
70	13	PEOPLE	250	200	3463	WATTS	ASHRAE1				
75	15	PEOPLE	250	200	13978	WATTS	ASHRAE1				
80	12	PEOPLE	250	200	11936	WATTS	ASHRAE1				
85	11	PEOPLE	250	200	4403	WATTS	ASHRAE1				
90	16	PEOPLE	250	200	5302	WATTS	ASHRAE1				
95	18	PEOPLE	250	200	6382	WATTS	ASHRAE1				
100	19	PEOPLE	250	200	9998	WATTS	ASHRAE1				
105	1	PEOPLE	250	200							
110	1	PEOPLE	250	200							
115	1	PEOPLE	250	200							
120	1	PEOPLE	250	200							
125	1	PEOPLE	250	200							
130	1	PEOPLE	250	200							
135	4	PEOPLE	250	200							
140	1	PEOPLE	250	200							

Card 28----- Miscellaneous Equipment -----											
Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
5	1	TYP. OFFICE EQ.	8500	WATTS	OFFICEL1						
10	1	TYP. OFFICE EQ.	1430	WATTS	OFFICEL1						
15	1	TYP. OFFICE EQ.	13814	WATTS	CLGONLY						
20	1	ELEV. MOTOR	6230	WATTS	CLGONLY						
30	1	OFFICE, LIGHT EQ	4636	WATTS	OFFICEL1						
40	1	MISC. EQ.	13132	WATTS	CLGONLY						
45	1	TYP OFFICE EQ	4250	WATTS	OFFICEL1						
55	1	TYP OFFICE EQ	830	WATTS	OFFICEL1						
60	1	TYP OFFICE EQ	7140	WATTS	OFFICEL1						
65	1	TYP OFFICE EQ	9040	WATTS	OFFICEL1						
70	1	TYP OFFICE EQ	12445	WATTS	OFFICEL1						
75	1	TYP OFFICE EQ	9220	WATTS	OFFICEL1						
85	1	TYP OFFICE EQ	4980	WATTS	CLGONLY						
90	1	TYP OFFICE EQ	23580	WATTS	OFFICEL1						
95	1	TYP OFFICE EQ	32541	WATTS	OFFICEL2						
100	1	MISC. OFFICE EQ	5995	WATTS	OFFICEL2						
105	1	COMPUTERS - UPS			OFFICEL1	ELEC					

Card 28----- Miscellaneous Equipment -----										
Room	Misc	Equipment	Energy	Energy	Schedule	Energy	Percent	Percent	Percent	
Number	Equipment	Descrip	Consump	Consump	Code	Meter	of Load	Misc. Load	Misc. Sens	Radiant
	Number		Value	Units		Code	Sensible	to Room	to Ret. Air	Fraction
110	1	COMPUTERS - UPS	7194	WATTS	OFFICEM1	ELEC				Optional
115	1	COMPUTERS - UPS	4700	WATTS	OFFICEM1	ELEC				Air Path
120	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC				
125	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC				
130	1	COMPUTERS - UPS	7320	WATTS	OFFICEM1	ELEC				
135	1	COMPUTERS - UPS	2214	WATTS	OFFICEM1	ELEC				
140	1	COMPUTERS - UPS	4892	WATTS	OFFICEM1	ELEC				
145	1	COMPUTERS - UPS	10978	WATTS	OFFICEM1	ELEC				
150	1	COMPUTERS - UPS	4434	WATTS	OFFICEM1	ELEC				
155	1	COMPUTERS - UPS	17545	WATTS	OFFICEM1	ELEC				

Card 29----- Room Airflows -----									
-----Ventilation-----					-----Infiltration-----				
-----Cooling-----		-----Heating-----			-----Cooling-----		-----Heating-----		--Reheat Minimum--
Room	Value	Units	Value	Units	Value	Units	Value	Units	Value
Number									Units
5	163	CFM	163	CFM					
10	163	CFM	163	CFM					
15	164	CFM	164	CFM					
20	251	CFM	251	CFM					
25	251	CFM	251	CFM					
30	251	CFM	251	CFM					
35	251	CFM	251	CFM					
40	251	CFM	251	CFM					
45	800	CFM	800	CFM					
50	393	CFM	393	CFM					
55	393	CFM	393	CFM					
60	393	CFM	393	CFM					
65	393	CFM	393	CFM					
70	394	CFM	394	CFM					
75	394	CFM	394	CFM					
80	375	CFM	375	CFM					
85	375	CFM	375	CFM					
90	375	CFM	375	CFM					
95	375	CFM	375	CFM					
100	1000	CFM	1000	CFM					
135	300	CFM	300	CFM					

Card 30----- Fan Airflows -----									
-----Main-----					-----Auxiliary-----				
-----Cooling-----		-----Heating-----			-----Cooling-----		-----Heating-----		--Room Exhaust--
Room	Value	Units	Value	Units	Value	Units	Value	Units	Value
Number									Units
5	2675	CFM	2675	CFM					
10	3180	CFM	3180	CFM					

Card 30----- Fan Airflows -----									
-----Main-----					-----Auxiliary-----				
Room Number	----Cooling----		----Heating----		----Cooling----		----Heating----		--Room Exhaust--
	Value	Units	Value	Units	Value	Units	Value	Units	Value Units
15	10917	CFM	10917	CFM					790 CFM
20	700	CFM	700	CFM					
25	800	CFM	800	CFM					
30	3025	CFM	3025	CFM					
35	845	CFM	845	CFM					
40	17300	CFM	17300	CFM					
45	9060	CFM	9060	CFM					
50	1100	CFM	1100	CFM					
55	1570	CFM	1570	CFM					
60	1910	CFM	1910	CFM					
65	2905	CFM	2905	CFM					
70	3075	CFM	3075	CFM					
75	6840	CFM	6840	CFM					
80	5952	CFM	5952	CFM					3769 CFM
85	2339	CFM	2339	CFM					
90	4268	CFM	4268	CFM					
95	3824	CFM	3824	CFM					
100	12518	CFM	12518	CFM					
105	8643	CFM	8643	CFM					
110	11962	CFM	11962	CFM					
115	4780	CFM	4780	CFM					
120	7526	CFM	7526	CFM					
125	7467	CFM	7467	CFM					
130	8800	CFM	8800	CFM					
135	11513	CFM	11513	CFM					
140	5409	CFM	5409	CFM					
145	10620	CFM	10620	CFM					
150	8893	CFM	8893	CFM					
155	23005	CFM	23005	CFM					

Card 31----- Partition Parameters -----									
Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
5	1	43	43	.18	110	CONSTANT	63	63	
10	1	68.5	68.5	.18	110	CONSTANT	63	63	
15	1	92.5	93	.18	110	CONSTANT	63	63	
20	1	26.5	26.5	0.18	110	CONSTANT	63	63	
25	1	27.5	27	0.18	110	CONSTANT	63	63	
30	1	55.5	55.5	0.18	110	CONSTANT	63	63	
35	1	64	10	0.18	110	CONSTANT	63	63	
40	1	50	10	0.18	110	CONSTANT	63	63	
45	1	111.5	10	0.18	110	CONSTANT	63	63	
60	1	45	45	0.18	110	CONSTANT	63	63	
65	1	89.5	37	0.18	110	CONSTANT	71	55	
70	1	89.5	37	0.18	110	CONSTANT	71	55	

Card 31----- Partition Parameters -----

Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
75	1	87	87	0.18	110	CONSTANT	71	55	
85	1	60	60	0.18	110	CONSTANT	71	55	

----- System Section Alternative #2 -----

## Card 39- System Alternative

Number	Description
1	EXISTING SECONDARY EQUIPMENT AND SYSTEMS

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----

System Set Number	System Type	Ventil Deck Location	Cooling SADBVh	Heating SADBVh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	BPMZ	ROADK					.127
2	BPMZ						
3	TRH						
4	TRH						
5	TRH	ROADK					.389
6	BPMZ						
7	COMP						
8	COMP						
9	COMP						
10	COMP						
11	COMP						
12	COMP						
13	COMP						
14	TRH						

Card 41----- Zone Assignment -----

System Set Number	Ref #1 Begin End	Ref #2 Begin End	Ref #3 Begin End	Ref #4 Begin End	Ref #5 Begin End	Ref #6 Begin End
1	1 3					
2	4 8					
3	9 9					
4	10 15					
5	16 19					
6	20 20					
7	21 21					
8	22 22					



## Card 41----- Zone Assignment -----

System

Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
9	23	23										
10	24	24										
11	25	25										
12	26	26										
13	27	27										
14	28	31										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.75					1.0					
2	1.5			.326							
3	2.4			.208							
4	2.5			.613							
5	3.45					1.5					
6	2.1			.26							
7	0.92										
8	1.67										
9	0.64										
10	1.39										
11	1.54										
12	1.04										
13	1.64			.077							
14	3.25										

## Card 43----- Airflow Design Temperatures -----

System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff
1					63	63				
2					63	63				
3					54	54				
4					49.5	49.5				
5					50	50				
6					62	62				
14					54	54				

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1						OFF	OFF	OFF		

Card 45----- Equipment Schedules -----

System	Main	Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling	Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
2					OFF	OFF	OFF		
6					OFF	OFF	OFF		

Card 47----- Fan Overrides -----

Sys	Clg	Htg	Ret	Mn Exh	Aux	Rm Exh	Opt Vnt	-----MAIN COOLING FAN-----			
Set	Fan	Fan	Fan	Fan	Fan	Fan	Sys fan	Mech	Air	Air	Size
Num	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Value	Units	Meth
3											Config
4											BLOW
5											BLOW
14											BLOW

----- Equipment Section Alternative #2 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	----- Demand Limit -----		
Number	Time of Day	Time of Day	Limit	Schedule	Temperature	Drift
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
1				EXISTING PRIMARY EQUIPMENT		

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	PKPLANT	1	14								

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----						-----HEAT RECOVERY-----				Seq	Demand
Ref	Code	Of	--Capacity--	----Energy----		--Capacity--	----Energy----		Order	Seq	Limit		
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	1	SER	
2	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	2	SER	

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
	Value	Units	Value	Units
1	39.3	KW	27.5	KW
2	0	KW	18.3	KW

over	Cold	Cooling	Misc.
Control	Storage	Tower	Access.
1		1	1
2		2	

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
1						85	65	HEATING
2						85	65	HEATING

## Card 65----- Heating Load Assignment -----

Load	All Coil
Assignment	Loads To
Reference	Heating Ref
1	1
2	3

-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
3 5	14 14							
7 13								

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy	Seq	Switch	Demand
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	Limit
Number	Name	Units	Value	Units	Value	Units	Number
1	EQ2002	1	0	KW	100	PCTEFF	
2	EQ2002	1	0	KW	100	PCTEFF	
3	EQ2263	1					

## Card 69----- Fan Equipment Parameters -----

System	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Set	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
Number							
1	EQ4003					EQ4003	EQ4003
2	EQ4003			EQ4003			
3	EQ4003			EQ4003			
4	EQ4003			EQ4003			
5	EQ4003					EQ4003	EQ4003
6	EQ4003			EQ4003			
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						
11	EQ4003						
12	EQ4003						
13	EQ4003			EQ4003			
14	EQ4003						

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Card 70----- Fan Equipment KW Overrides -----													
-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY----					
System	Cool	Heat	Ret	Exh	Aux	Room	Opt					Room	Opt
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux		Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan		Fan	Fan
1	6.5					1.2	.25						
2	10.2			.652									
3	6.5			.415									
4	17.3			1.225									
5	13.9					2.7	.779						
6	7.4			.519									
7	3.3												
8	5.6												
9	1.8												
10	3.7												
11	4.7												
12	3.3												
13	5.6			.156									
14	22.7												

Card 71----- Base Utility Parameters -----										
Base	Base	Hourly	Hourly	Schedule	Energy	Equip	Demand			
Utility	Utility	Demand	Demand		Type	Reference	Limiting	Entering	Leaving	
Number	Descrip	Value	Units	Code		Number	Number	Temp	Temp	
1	CHW PIPING LOSS	4.64	TONS	AVAIL	CHILL-LD	1				
2	HW PIPING LOSS	77.4	MBH	AVAIL	HOT-LD	1				

Card 74----- Condenser / Cooling Tower Parameters -----											
Cooling				Energy	Energy			Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			12.5	KW	T-WATER	CTOWER	1			
2	EQ5100			10.8	KW	T-WATER	CTOWER	1			

Card 75----- Miscellaneous Accessory -----											
#1				#2				#3			
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units
1	EQ5020	16.6	KW								

----- Load Section Alternative #3 -----

## Card 19- Load Alternative -

Number Description  
3 ECO B - OCCUPANCY SENSORS

## ECO-B, LSTC BUILDING

Card 20----- General Room Parameters -----											
Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Number	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
		Descrip					Resistance	Height	Multiplier	Zone	
5	1	B-17 B,C,& D	25.5	59.5	10	2		10			
10	2	B-17,18,AEROBICS	59	59.5	10	2		10			
15	3	B-8,16,27-32	80.5	80.5	10	2		10			
20	4	B-25,25A	22	15	10	2		10			
25	5	B-4	27	27.5	10	2		10			
30	6	B-12,12A	55.5	55.5	10	2		10			
35	7	B-2,13,19,20-22	45.5	45.5	10	2		10			
40	8	B-1,3,24	81	81	10	2		10			
45	9	B-9,10,11,11A	111.5	20	10	2		10			
50	10	DOMES,MAIN WINGS	40	40.5	10	2		10			
55	11	SW LOWER DOME	48	48	10	2		10			
60	12	NE LOWER DOME	48	48	10	2		10			
65	13	MAIN FLR WEST	89.5	37	10	2		10			
70	14	MAIN FLR EAST	61	61	10	2		10			
75	15	112,119A,123A,	94.5	95	10	2		10			
80	16	MAIN FLOOR CENTR	93	93.5	10	2		10			
85	17	MAIN FLOOR SOUTH	51	51	10	2		10			
90	18	L.DOME COMP. RMS.	63.5	63.5	10	2		10			
95	19	L.DOME OFFICES	71	71	10	2		10			
100	20	U.DOME	88.5	88.5	10	2		10			
105	21	RM 119, AH-8	1	1							
110	22	RM 119A, AH-9	1	1							
115	23	RM 123, AH-10	1	1							
120	24	RM 127A, AH-11A	1	1							
125	25	RM 127A, AH-11B	1	1							
130	26	RM 127, AH-12	1	1							
135	27	AUX CNTRL, AH-14	1	1							
140	28	RM 110 UNDERFLOR	33	34	10	2		10			
145	29	RM 120A,122,126A	50	50	10	2		10			
150	30	RM 146A,148,148A	32	32	10	2		10			
155	31	204,205,206,207	63.5	63.5	10	2		10			

Card 21----- Thermostat Parameters -----										
Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Number	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
5	75	50	75		70	70			HEAVY130	NO
10	75	50	75		70	70			HEAVY130	NO
15	75	50	75		70	70			HEAVY130	NO
20	75	50	75		70	70			HEAVY130	NO
25	75	50	75		70	70			HEAVY130	NO
30	75	50	75		70	70			HEAVY130	NO

Card 21----- Thermostat Parameters -----										
Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	Heating T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
35	75	50	75		70	70			HEAVY130	NO
40	75	50	75		70	70			HEAVY130	NO
45	70	45	70		70	70			HEAVY130	NO
50	75	50	75		70	70			HEAVY130	NO
55	75	50	75		70	70			HEAVY130	NO
60	75	50	75		70	70			HEAVY130	NO
65	75	50	75		70	70			HEAVY130	NO
70	75	50	75		70	70			HEAVY130	NO
75	75	50	75		70	70			HEAVY130	NO
80	70	45	70		70	70			HEAVY130	NO
85	75	50	75		70	70			HEAVY130	NO
90	70	45	70		70	70			HEAVY130	NO
95	75	50	75		70	70			HEAVY130	NO
100	75	50	75		70	70			HEAVY130	NO
105	70	45	70		70	70			HEAVY130	NO
110	70	45	70		70	70				
115	70	45	70		70	70				
120	70	45	70		70	70				
125	70	45	70		70	70				
130	70	45	70		70	70				
135	70	45	70		70	70				
140	70	45	70		70	70				
145	70	45	70		70	70				
150	70	45	70		70	70				
155	70	45	70		70	70				

Card 22----- Roof Parameters -----									
Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
50	1	YES			0.18	19			.4
100	1	NO	88	88	0.18	19			.4

Card 24----- Wall Parameters -----									
Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Ground Reflectance Multiplier
50	1	26.5	31	0.18	94	0		.4	
50	2	26.5	31	0.18	94	90		.4	
50	3	26.5	31	0.18	94	180		.4	
50	4	26.5	31	0.18	94	270		.4	
55	1	42	15	0.18	94	0		.4	
55	2	42	15	0.18	94	90		.4	

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall		Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc	Type				Reflectance Multiplier
55	3	42	15	0.18	94		180		.4	
55	4	42	15	0.18	94		270		.4	
60	1	42	15	0.18	94		0		.4	
60	2	42	15	0.18	94		90		.4	
60	3	42	15	0.18	94		180		.4	
60	4	42	15	0.18	94		270		.4	
90	1	37.5	10	0.18	94		0		.4	
90	2	37.5	10	0.18	94		90		.4	
90	3	37.5	10	0.18	94		180		.4	
90	4	37.5	10	0.18	94		270		.4	
95	1	47	10	0.18	94		0		.4	
95	2	47.5	10	0.18	94		90		.4	
95	3	47	10	0.18	94		180		.4	
95	4	47.5	10	0.18	94		270		.4	
100	1	78	29	0.18	94		0		.4	
100	2	78.5	29	0.18	94		90		.4	
100	3	78	29	0.18	94		180		.4	
100	4	78.5	29	0.18	94		270		.4	

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	OFFICEP1	OFFICEL7								
10	OFFICEP1	OFFICEL8								
15	OFFICEP1	OFFICEL9								
20		OFICEL10								
25		OFICEL11								
30	OFFICEP1	OFICEL12								
35	OFFICEP1	OFICEL13								
40		CLGONLY								
45	OFFICEP1	OFICEL14								
50	OFFICEP1	CLGONLY								
55	OFFICEP1	OFICEL15								
60	OFFICEP1	OFICEL16								
65	OFFICEP1	OFICEL17								
70	OFFICEP1	OFICEL18								
75	OFFICEP1	OFICEL19								
80	OFFICEP1	OFICEL20								
85	OFFICEP1	OFICEL21								
90	OFFICEP1	OFFICEL7								
95	OFFICEP1	OFICEL22								
100	OFFICEP1	OFICEL23								
105	CLGONLY									
110	CLGONLY									
115	CLGONLY									

Card 26----- Schedules -----										
Room					Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number	People	Lights	Ventilation	Infiltration	Minimum	Fans	Fan	Fan	Exhaust	Controls
120	CLGONLY									
125	CLGONLY									
130	CLGONLY									
135	CLGONLY									
140	CLGONLY									

Card 27----- People and Lights -----												
Room	People	People	People	People	Lighting	Lighting	Lighting	Ballast	Percent	--- Daylighting ---		
Number	Value	Units	Sensible	Latent	Value	Units	Fixture Type	Factor	Lights to Ret. Air	Reference Point 1	Reference Point 2	
5	7	PEOPLE	250	200	1876	WATTS	ASHRAE1					
10	3	PEOPLE	250	200	3263	WATTS	SUSFLUOR					
15	2	PEOPLE	250	200	7204	WATTS	SUSFLUOR					
20					375	WATTS	SUSFLUOR					
25					2060	WATTS	SUSFLUOR					
30	2	PEOPLE	250	200	2683	WATTS	ASHRAE1					
35					1115	WATTS	ASHRAE1					
40					3683	WATTS	ASHRAE1					
45	3	PEOPLE	250	200	4838	WATTS	ASHRAE1					
50	1	PEOPLE	250	200	374	WATTS	ASHRAE1					
55	1	PEOPLE	250	200	2870	WATTS	ASHRAE1					
60	3	PEOPLE	250	200	3024	WATTS	ASHRAE1					
65	7	PEOPLE	250	200	5967	WATTS	SUSFLUOR					
70	13	PEOPLE	250	200	3463	WATTS	ASHRAE1					
75	15	PEOPLE	250	200	13978	WATTS	ASHRAE1					
80	12	PEOPLE	250	200	11936	WATTS	ASHRAE1					
85	11	PEOPLE	250	200	4403	WATTS	ASHRAE1					
90	16	PEOPLE	250	200	5302	WATTS	ASHRAE1					
95	18	PEOPLE	250	200	6382	WATTS	ASHRAE1					
100	19	PEOPLE	250	200	9998	WATTS	ASHRAE1					
105	1	PEOPLE	250	200								
110	1	PEOPLE	250	200								
115	1	PEOPLE	250	200								
120	1	PEOPLE	250	200								
125	1	PEOPLE	250	200								
130	1	PEOPLE	250	200								
135	4	PEOPLE	250	200								
140	1	PEOPLE	250	200								

Card 28----- Miscellaneous Equipment -----										
Room	Misc	Equipment	Energy	Energy	Energy	Percent	Percent	Percent	Radiant	Optional
Number	Equipment	Equipment	Consump	Consump	Schedule	of Load	Misc. Load	Misc. Sens	Fraction	Air Path
	Number	Descrip	Value	Units	Code	Sensible	to Room	to Ret. Air		
5	1	TYP. OFFICE EQ.	8500	WATTS	OFFICEL1					



Card 28----- Miscellaneous Equipment -----											
Room	Misc	Equipment	Energy	Energy	Energy	Percent	Percent	Percent			
Number	Equipment	Equipment	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant	Optional
	Number	Descrip	Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction	Air Path
10	1	TYP. OFFICE EQ.	1430	WATTS	OFFICEL1						
15	1	TYP. OFFICE EQ.	13814	WATTS	CLGONLY						
20	1	ELEV. MOTOR	6230	WATTS	CLGONLY						
30	1	OFFICE, LIGHT EQ	4636	WATTS	OFFICEL1						
40	1	MISC. EQ.	13132	WATTS	CLGONLY						
45	1	TYP OFFICE EQ	4250	WATTS	OFFICEL1						
55	1	TYP OFFICE EQ	830	WATTS	OFFICEL1						
60	1	TYP OFFICE EQ	7140	WATTS	OFFICEL1						
65	1	TYP OFFICE EQ	9040	WATTS	OFFICEL1						
70	1	TYP OFFICE EQ	12445	WATTS	OFFICEL1						
85	1	TYP OFFICE EQ	9220	WATTS	OFFICEL1						
90	1	TYP OFFICE EQ	4980	WATTS	CLGONLY						
95	1	TYP OFFICE EQ	23580	WATTS	OFFICEL1						
100	1	MISC. OFFICE EQ	32541	WATTS	OFFICEL2						
105	1	COMPUTERS - UPS	5995	WATTS	OFFICEM1	ELEC					
110	1	COMPUTERS - UPS	7194	WATTS	OFFICEM1	ELEC					
115	1	COMPUTERS - UPS	4700	WATTS	OFFICEM1	ELEC					
120	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC					
125	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC					
130	1	COMPUTERS - UPS	7320	WATTS	OFFICEM1	ELEC					
135	1	COMPUTERS - UPS	2214	WATTS	OFFICEM1	ELEC					
140	1	COMPUTERS - UPS	4892	WATTS	OFFICEM1	ELEC					
145	1	COMPUTERS - UPS	10978	WATTS	OFFICEM1	ELEC					
150	1	COMPUTERS - UPS	4434	WATTS	OFFICEM1	ELEC					
155	1	COMPUTERS - UPS	17545	WATTS	OFFICEM1	ELEC					

Card 29----- Room Airflows -----									
-----Ventilation-----					-----Infiltration-----				
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value Units
5	163	CFM	163	CFM					
10	163	CFM	163	CFM					
15	164	CFM	164	CFM					
20	251	CFM	251	CFM					
25	251	CFM	251	CFM					
30	251	CFM	251	CFM					
35	251	CFM	251	CFM					
40	251	CFM	251	CFM					
45	800	CFM	800	CFM					
50	393	CFM	393	CFM					
55	393	CFM	393	CFM					
60	393	CFM	393	CFM					
65	393	CFM	393	CFM					
70	394	CFM	394	CFM					
75	394	CFM	394	CFM					

Card 29-----					Room Airflows-----					
-----Ventilation-----					-----Infiltration-----					
Room	----Cooling----		----Heating----		----Cooling----		----Heating----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
80	375	CFM	375	CFM						
85	375	CFM	375	CFM						
90	375	CFM	375	CFM						
95	375	CFM	375	CFM						
100	1000	CFM	1000	CFM						
135	300	CFM	300	CFM						

Card 30-----					Fan Airflows-----					
-----Main-----					-----Auxiliary-----					
Room	----Cooling----		----Heating----		----Cooling----		----Heating----		--Room Exhaust--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	2675	CFM	2675	CFM						
10	3180	CFM	3180	CFM						
15	10917	CFM	10917	CFM					790	CFM
20	700	CFM	700	CFM						
25	800	CFM	800	CFM						
30	3025	CFM	3025	CFM						
35	845	CFM	845	CFM						
40	17300	CFM	17300	CFM						
45	9060	CFM	9060	CFM						
50	1100	CFM	1100	CFM						
55	1570	CFM	1570	CFM						
60	1910	CFM	1910	CFM						
65	2905	CFM	2905	CFM						
70	3075	CFM	3075	CFM						
75	6840	CFM	6840	CFM						
80	5952	CFM	5952	CFM					3769	CFM
85	2339	CFM	2339	CFM						
90	4268	CFM	4268	CFM						
95	3824	CFM	3824	CFM						
100	12518	CFM	12518	CFM						
105	8643	CFM	8643	CFM						
110	11962	CFM	11962	CFM						
115	4780	CFM	4780	CFM						
120	7526	CFM	7526	CFM						
125	7467	CFM	7467	CFM						
130	8800	CFM	8800	CFM						
135	11513	CFM	11513	CFM						
140	5409	CFM	5409	CFM						
145	10620	CFM	10620	CFM						
150	8893	CFM	8893	CFM						
155	23005	CFM	23005	CFM						

Room Number	Partition Number	Partition Parameters							
		Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
5	1	43	43	.18	110	CONSTANT	63	63	
10	1	68.5	68.5	.18	110	CONSTANT	63	63	
15	1	92.5	93	.18	110	CONSTANT	63	63	
20	1	26.5	26.5	0.18	110	CONSTANT	63	63	
25	1	27.5	27	0.18	110	CONSTANT	63	63	
30	1	55.5	55.5	0.18	110	CONSTANT	63	63	
35	1	64	10	0.18	110	CONSTANT	63	63	
40	1	50	10	0.18	110	CONSTANT	63	63	
45	1	111.5	10	0.18	110	CONSTANT	63	63	
60	1	45	45	0.18	110	CONSTANT	63	63	
65	1	89.5	37	0.18	110	CONSTANT	63	63	
70	1	89.5	37	0.18	110	CONSTANT	71	55	
75	1	87	87	0.18	110	CONSTANT	71	55	
85	1	60	60	0.18	110	CONSTANT	71	55	

## System Section Alternative #3

Number	Description
1	EXISTING SECONDARY EQUIPMENT AND SYSTEMS

-----OPTIONAL VENTILATION SYSTEM-----								
System	Set	System	Deck	Cooling	Heating	Cooling	Heating	Fan
Number	Type	Location	SADBvh	SADBvh	Schedule	Schedule	Static	Pressure
1	BPMZ	ROADK						.127
2	BPMZ							
3	TRH							
4	TRH							
5	TRH	ROADK						
6	BPMZ							.389
7	COMP							
8	COMP							
9	COMP							
10	COMP							
11	COMP							
12	COMP							
13	COMP							
14	TRH							

System Set Number	Zone Assignment											
	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	2	3	4	5	6	7	8	9	10	11	12
2	1	2	3	4	5	6	7	8	9	10	11	12
3	1	2	3	4	5	6	7	8	9	10	11	12
4	1	2	3	4	5	6	7	8	9	10	11	12
5	1	2	3	4	5	6	7	8	9	10	11	12
6	1	2	3	4	5	6	7	8	9	10	11	12
7	1	2	3	4	5	6	7	8	9	10	11	12
8	1	2	3	4	5	6	7	8	9	10	11	12
9	1	2	3	4	5	6	7	8	9	10	11	12
10	1	2	3	4	5	6	7	8	9	10	11	12
11	1	2	3	4	5	6	7	8	9	10	11	12
12	1	2	3	4	5	6	7	8	9	10	11	12
13	1	2	3	4	5	6	7	8	9	10	11	12
14	1	2	3	4	5	6	7	8	9	10	11	12
15	1	2	3	4	5	6	7	8	9	10	11	12
16	1	2	3	4	5	6	7	8	9	10	11	12
17	1	2	3	4	5	6	7	8	9	10	11	12
18	1	2	3	4	5	6	7	8	9	10	11	12
19	1	2	3	4	5	6	7	8	9	10	11	12
20	1	2	3	4	5	6	7	8	9	10	11	12
21	1	2	3	4	5	6	7	8	9	10	11	12
22	1	2	3	4	5	6	7	8	9	10	11	12
23	1	2	3	4	5	6	7	8	9	10	11	12
24	1	2	3	4	5	6	7	8	9	10	11	12
25	1	2	3	4	5	6	7	8	9	10	11	12
26	1	2	3	4	5	6	7	8	9	10	11	12
27	1	2	3	4	5	6	7	8	9	10	11	12
28	1	2	3	4	5	6	7	8	9	10	11	12
29	1	2	3	4	5	6	7	8	9	10	11	12
30	1	2	3	4	5	6	7	8	9	10	11	12
31	1	2	3	4	5	6	7	8	9	10	11	12
32	1	2	3	4	5	6	7	8	9	10	11	12
33	1	2	3	4	5	6	7	8	9	10	11	12
34	1	2	3	4	5	6	7	8	9	10	11	12
35	1	2	3	4	5	6	7	8	9	10	11	12
36	1	2	3	4	5	6	7	8	9	10	11	12
37	1	2	3	4	5	6	7	8	9	10	11	12
38	1	2	3	4	5	6	7	8	9	10	11	12

Card 41----- Zone Assignment -----											
System											
Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin End
2	4	8									
3	9	9									
4	10	15									
5	16	19									
6	20	20									
7	21	21									
8	22	22									
9	23	23									
10	24	24									
11	25	25									
12	26	26									
13	27	27									
14	28	31									

Card 42----- Fan SP and Duct Parameters-----												
System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return	
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air	
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path	
1	1.75					1.0						
2	1.5			.326								
3	2.4			.208								
4	2.5			.613								
5	3.45					1.5						
6	2.1			.26								
7	0.92											
8	1.67											
9	0.64											
10	1.39											
11	1.54											
12	1.04											
13	1.64			.077								
14	3.25											

Card 43----- Airflow Design Temperatures -----										
System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff
1					63	63				
2					63	63				
3					54	54				
4					49.5	49.5				

Card 43----- Airflow Design Temperatures -----											
System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Design	
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec	
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff	
5					50	50					
6					62	62					
14					54	54					

Card 45----- Equipment Schedules -----											
System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary	
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating	
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil	
1						OFF	OFF	OFF			
2						OFF	OFF	OFF			
6						OFF	OFF	OFF			

Card 47----- Fan Overrides -----													
Sys	Clg	Htg	Ret	Mn Exh	Aux	Rm Exh	Opt Vnt	-----MAIN COOLING FAN-----					
Set	Fan	Fan	Fan	Fan	Fan	Fan	Sys Fan	Mech	Air	Air	Size		
Num	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Value	Units	Meth	Confg	
3												BLOW	
4												BLOW	
5												BLOW	
14												BLOW	

----- Equipment Section Alternative #3 -----

Card 59----- Equipment Description / TOD Schedules -----									
	Elec Consump	Elec Demand	Demand						
Alternative	Time of Day	Time of Day	Limit					----- Demand Limit ---	
Number	Schedule	Schedule	Max KW	Alternative Description				Temperature	
1				EXISTING PRIMARY EQUIPMENT				Schedule	Drift

Card 60----- Cooling Load Assignment -----												
Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	PKPLANT	1 14									

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Cooling Equipment Parameters										Seq Order	Seq Type	Demand Limit Number
COOLING						HEAT RECOVERY						
Cool Equip Ref Code	Num Of	--Capacity--		--Energy--		--Capacity--		--Energy--				
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	1	SER
1	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	2	SER
2	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW		

Cooling Pumps and References										
Card 63	---CHILLED WATER---		---CONDENSER---		---HT REC or AUX---		Switch-	Cold	Cooling	Misc.
Cool	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Storage	Tower	Access.
Ref	Value	Units	Value	Units	Value	Units	Control		1	1
Num									2	
1	39.3	KW	27.5	KW						
2	0	KW	18.3	KW						

Cooling Equipment Options										Cond Rej a HW	Cond Rej Temp
Cool	Max	Load	Free	Cond	Cond	Cond	Cond	Cond	Cond		
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref	To Ref	Number	Temp
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type	Number	Temp	Temp
1						85	65	HEATING	1	95	
2						85	65	HEATING	2	95	

Heating Load Assignment										All Coil Loads To	-Group 1- Begin End	-Group 2- Begin End	-Group 3- Begin End	-Group 4- Begin End	-Group 5- Begin End	-Group 6- Begin End	-Group 7- Begin End	-Group 8- Begin End	-Group 9- Begin End
Load	Assignment	Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1		1		3	5	14	14												
2		3		7	13														

Heating Equipment Parameters										Seq Order	Switch over	Hot Strg	Misc. Acc.	Demand Limit Number
Heat	Equip	Number	HW Pmp	Cap'y	Energy	Rate	Seq	Switch	Hot					
Ref	Code	Of	Full Ld	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number	
Number	Name	Units	Value	Units	Value	Units	Value	Units	100	PCTEFF				
1	EQ2002	1	0	KW			100	PCTEFF						
2	EQ2002	1	0	KW			100	PCTEFF						
3	EQ2263	1												

Fan Equipment Parameters							
System Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	EQ4003					EQ4003	EQ4003
2	EQ4003					EQ4003	
3	EQ4003					EQ4003	
4	EQ4003					EQ4003	EQ4003
5	EQ4003						

## Card 69----- Fan Equipment Parameters -----

System

Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
6	EQ4003			EQ4003			
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						
11	EQ4003						
12	EQ4003						
13	EQ4003			EQ4003			
14	EQ4003						

## Card 70----- Fan Equipment KW Overrides -----

System Set Number	---MAIN SYSTEM---			--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY---					
	Cool Fan	Heat Fan	Ret Fan	Exh Fan	Aux Sup	Room Exh	Opt Vent	Cool Fan	Heat Fan	Aux Fan	Room Exh	Opt Vent
1	6.5					1.2	.25					
2	10.2			.652								
3	6.5			.415								
4	17.3			1.225								
5	13.9				2.7	.779						
6	7.4			.519								
7	3.3											
8	5.6											
9	1.8											
10	3.7											
11	4.7											
12	3.3											
13	5.6			.156								
14	22.7											

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
2	HW PIPING LOSS	77.4	MBH	AVAIL	HOT-LD	1			

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower Ref	Cooling Tower Code	Capacity Value	Capacity Units	Energy Consump Value	Energy Consump Units	Fluid Type	Tower Type	Number Of Cells	Percent Airflow Low Spd	Low Spd Energy Value	Low Spd Energy Units

Card 74-----				Condenser / Cooling Tower Parameters				Number	Percent	Low Spd	Low Spd
Tower	Cooling	Capacity	Capacity	Energy	Energy	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Tower	Value	Units	Consump	Consump	Type	Type	Cells	Low Spd	Value	Units
	Code			Value	Units	T-WATER	CTOWER	1			
2	EQ5100			10.8	KW						

Card 75----- Miscellaneous Accessory -----												
#1					#2				#3			
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
1	EQ5020	16.6	KW									

----- Load Section Alternative #4 -----

Card 19- Load Alternative -  
 Number Description  
 4 ECO C -

## ECO-C, LSTC BUILDING

Card 20----- General Room Parameters -----											
Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
5	1	B-17 B,C,& D	25.5	59.5	10	2		10			
10	2	B-17,18,AEROBICS	59	59.5	10	2		10			
15	3	B-8,16,27-32	80.5	80.5	10	2		10			
20	4	B-25,25A	22	15	10	2		10			
25	5	B-4	27	27.5	10	2		10			
30	6	B-12,12A	55.5	55.5	10	2		10			
35	7	B-2,13,19,20-22	45.5	45.5	10	2		10			
40	8	B-1,3,24	81	81	10	2		10			
45	9	B-9,10,11,11A	111.5	20	10	2		10			
50	10	DOMES,MAIN WINGS	40	40.5	10	2		10			
55	11	SW LOWER DOME	48	48	10	2		10			
60	12	NE LOWER DOME	48	48	10	2		10			
65	13	MAIN FLR WEST	89.5	37	10	2		10			
70	14	MAIN FLR EAST	61	61	10	2		10			
75	15	112,119A,123A,	94.5	95	10	2		10			
80	16	MAIN FLOOR CENTR	93	93.5	10	2		10			
85	17	MAIN FLOOR SOUTH	51	51	10	2		10			
90	18	L.DOME COMP. RMS.	63.5	63.5	10	2		10			
95	19	L.DOME OFFICES	71	71	10	2		10			
100	20	U.DOME	88.5	88.5	10	2					
105	21	RM 119, AH-8	1	1							



Card 20----- General Room Parameters -----											
Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Number	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
		Descrip					Resistance	Height	Multiplier	Zone	
110	22	RM 119A, AH-9	1	1							
115	23	RM 123, AH-10	1	1							
120	24	RM 127A, AH-11A	1	1							
125	25	RM 127A, AH-11B	1	1							
130	26	RM 127, AH-12	1	1							
135	27	AUX CNTRL, AH-14	1	1							
140	28	RM 110 UNDERFLOR	33	34	10	2		10			
145	29	RM 120A,122,126A	50	50	10	2		10			
150	30	RM 146A,148,148A	32	32	10	2		10			
155	31	204,205,206,207	63.5	63.5	10	2		10			

Card 21----- Thermostat Parameters -----											
Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet	
Number	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On	
	Design	DB	RH	Driftpoint	Design	DB	Driftpoint	Schedule	Flag	Average	Floor
5	75	50	75		70	70				HEAVY130	NO
10	75	50	75		70	70				HEAVY130	NO
15	75	50	75		70	70				HEAVY130	NO
20	75	50	75		70	70				HEAVY130	NO
25	75	50	75		70	70				HEAVY130	NO
30	75	50	75		70	70				HEAVY130	NO
35	75	50	75		70	70				HEAVY130	NO
40	75	50	75		70	70				HEAVY130	NO
45	70	45	70		70	70				HEAVY130	NO
50	75	50	75		70	70				HEAVY130	NO
55	75	50	75		70	70				HEAVY130	NO
60	75	50	75		70	70				HEAVY130	NO
65	75	50	75		70	70				HEAVY130	NO
70	75	50	75		70	70				HEAVY130	NO
75	75	50	75		70	70				HEAVY130	NO
80	70	45	70		70	70				HEAVY130	NO
85	75	50	75		70	70				HEAVY130	NO
90	70	45	70		70	70				HEAVY130	NO
95	75	50	75		70	70				HEAVY130	NO
100	75	50	75		70	70				HEAVY130	NO
105	70	45	70		70	70					
110	70	45	70		70	70					
115	70	45	70		70	70					
120	70	45	70		70	70					
125	70	45	70		70	70					
130	70	45	70		70	70					
135	70	45	70		70	70					
140	70	45	70		70	70					
145	70	45	70		70	70					
150	70	45	70		70	70					

Card 21----- Thermostat Parameters -----										
Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	Heating T'stat	T'stat Location	Mass / Carpet
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	No. Hrs	On Floor
155	70	45	70		70	70			Average	Floor

Card 22----- Roof Parameters -----									
Roof									
Room	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Equal to Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
50	1	YES			0.18	19			.4
100	1	NO	88	88	0.18	19			.4

Card 24----- Wall Parameters -----										
Wall										Ground
Room	Wall	Wall	Wall	Wall	Constuc	Wall	Wall	Wall	Wall	Reflectance
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Multiplier	
50	1	26.5	31	0.18	94	0		.4		
50	2	26.5	31	0.18	94	90		.4		
50	3	26.5	31	0.18	94	180		.4		
50	4	26.5	31	0.18	94	270		.4		
55	1	42	15	0.18	94	0		.4		
55	2	42	15	0.18	94	90		.4		
55	3	42	15	0.18	94	180		.4		
55	4	42	15	0.18	94	270		.4		
60	1	42	15	0.18	94	0		.4		
60	2	42	15	0.18	94	90		.4		
60	3	42	15	0.18	94	180		.4		
60	4	42	15	0.18	94	270		.4		
90	1	37.5	10	0.18	94	0		.4		
90	2	37.5	10	0.18	94	90		.4		
90	3	37.5	10	0.18	94	180		.4		
90	4	37.5	10	0.18	94	270		.4		
95	1	47	10	0.18	94	0		.4		
95	2	47.5	10	0.18	94	90		.4		
95	3	47	10	0.18	94	180		.4		
95	4	47.5	10	0.18	94	270		.4		
100	1	78	29	0.18	94	0		.4		
100	2	78.5	29	0.18	94	90		.4		
100	3	78	29	0.18	94	180		.4		
100	4	78.5	29	0.18	94	270		.4		

Card 26----- Schedules -----										
Room	People	Lights	Ventilation	Infiltration	Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number					Minimum	Fans	Fan	Fan	Exhaust	Controls
5	OFFICEP1	OFFICEL7				DAYSCHE				

Card 26-----					Schedules -----					
Room					Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number	People	Lights	Ventilation	Infiltration	Minimum	Fans	Fan	Fan	Exhaust	Controls
10	OFFICEP1	OFFICEL8				DAYSCHED				
15	OFFICEP1	OFFICEL9				DAYSCHED				DAYSCHED
20		OFICEL10				DAYSCHED				
25		OFICEL11				DAYSCHED				
30	OFFICEP1	OFFICEL12				DAYSCHED				
35	OFFICEP1	OFFICEL13				DAYSCHED				
40		CLGONLY				DAYSCHED				
45	OFFICEP1	OFFICEL14				DAYSCHED				
50	OFFICEP1	CLGONLY				DAYSCHED				
55	OFFICEP1	OFFICEL15				DAYSCHED				
60	OFFICEP1	OFFICEL16				DAYSCHED				
65	OFFICEP1	OFFICEL17				DAYSCHED				
70	OFFICEP1	OFFICEL18				DAYSCHED				
75	OFFICEP1	OFFICEL19				DAYSCHED				DAYSCHED
80	OFFICEP1	OFFICEL20				DAYSCHED				
85	OFFICEP1	OFFICEL21				DAYSCHED				
90	OFFICEP1	OFFICEL7				DAYSCHED				
95	OFFICEP1	OFFICEL22				DAYSCHED				
100	OFFICEP1	OFFICEL23				DAYSCHED				
105	CLGONLY									
110	CLGONLY									
115	CLGONLY									
120	CLGONLY									
125	CLGONLY									
130	CLGONLY									
135	CLGONLY									
140	CLGONLY									

Card 27----- People and Lights -----											
Room	People	People	People	People	Lighting	Lighting	Lighting	Ballast	Percent	--- Daylighting ---	
Number	Value	Units	Sensible	Latent	Value	Units	Fixture Type	Factor	Lights to Ret. Air	Reference Point 1	Reference Point 2
5	7	PEOPLE	250	200	1876	WATTS	ASHRAE1				
10	3	PEOPLE	250	200	3263	WATTS	SUSFLUOR				
15	2	PEOPLE	250	200	7204	WATTS	SUSFLUOR				
20					375	WATTS	SUSFLUOR				
25					2060	WATTS	SUSFLUOR				
30	2	PEOPLE	250	200	2683	WATTS	ASHRAE1				
35					1115	WATTS	ASHRAE1				
40					3683	WATTS	ASHRAE1				
45	3	PEOPLE	250	200	4838	WATTS	ASHRAE1				
50	1	PEOPLE	250	200	374	WATTS	ASHRAE1				
55	1	PEOPLE	250	200	2870	WATTS	ASHRAE1				
60	3	PEOPLE	250	200	3024	WATTS	ASHRAE1				
65	7	PEOPLE	250	200	5967	WATTS	SUSFLUOR				

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Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting --- Reference Point 1	Reference Point 2
70	13	PEOPLE	250	200	3463	WATTS	ASHRAE1				
75	15	PEOPLE	250	200	13978	WATTS	ASHRAE1				
80	12	PEOPLE	250	200	11936	WATTS	ASHRAE1				
85	11	PEOPLE	250	200	4403	WATTS	ASHRAE1				
90	16	PEOPLE	250	200	5302	WATTS	ASHRAE1				
95	18	PEOPLE	250	200	6382	WATTS	ASHRAE1				
100	19	PEOPLE	250	200	9998	WATTS	ASHRAE1				
105	1	PEOPLE	250	200							
110	1	PEOPLE	250	200							
115	1	PEOPLE	250	200							
120	1	PEOPLE	250	200							
125	1	PEOPLE	250	200							
130	1	PEOPLE	250	200							
135	4	PEOPLE	250	200							
140	1	PEOPLE	250	200							

Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
5	1	TYP. OFFICE EQ.	8500	WATTS	OFFICEL1						
10	1	TYP. OFFICE EQ.	1430	WATTS	OFFICEL1						
15	1	TYP. OFFICE EQ.	13814	WATTS	CLGONLY						
20	1	ELEV. MOTOR	6230	WATTS	CLGONLY						
30	1	OFFICE, LIGHT EQ	4636	WATTS	OFFICEL1						
40	1	MISC. EQ.	13132	WATTS	CLGONLY						
45	1	TYP OFFICE EQ	4250	WATTS	OFFICEL1						
55	1	TYP OFFICE EQ	830	WATTS	OFFICEL1						
60	1	TYP OFFICE EQ	7140	WATTS	OFFICEL1						
65	1	TYP OFFICE EQ	9040	WATTS	OFFICEL1						
70	1	TYP OFFICE EQ	12445	WATTS	OFFICEL1						
85	1	TYP OFFICE EQ	9220	WATTS	OFFICEL1						
90	1	TYP OFFICE EQ	4980	WATTS	CLGONLY						
95	1	TYP OFFICE EQ	23580	WATTS	OFFICEL1						
100	1	MISC. OFFICE EQ	32541	WATTS	OFFICEL2						
105	1	COMPUTERS - UPS	5995	WATTS	OFFICEM1	ELEC					
110	1	COMPUTERS - UPS	7194	WATTS	OFFICEM1	ELEC					
115	1	COMPUTERS - UPS	4700	WATTS	OFFICEM1	ELEC					
120	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC					
125	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC					
130	1	COMPUTERS - UPS	7320	WATTS	OFFICEM1	ELEC					
135	1	COMPUTERS - UPS	2214	WATTS	OFFICEM1	ELEC					
140	1	COMPUTERS - UPS	4892	WATTS	OFFICEM1	ELEC					
145	1	COMPUTERS - UPS	10978	WATTS	OFFICEM1	ELEC					
150	1	COMPUTERS - UPS	4434	WATTS	OFFICEM1	ELEC					

Card 28----- Miscellaneous Equipment -----										
Room	Misc	Equipment	Energy	Energy	Energy	Percent	Percent	Percent		
Number	Equipment	Equipment	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant
	Number	Descrip	Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction
155	1	COMPUTERS - UPS	17545	WATTS	OFFICEM1	ELEC				Optional
										Air Path

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--		
Room	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	20	CFM-P	20	CFM-P						
10	20	CFM-P	20	CFM-P						
20	20	CFM-P	20	CFM-P						
25	20	CFM-P	20	CFM-P						
30	20	CFM-P	20	CFM-P						
35	20	CFM-P	20	CFM-P						
40	20	CFM-P	20	CFM-P						
45	20	CFM-P	20	CFM-P						
50	20	CFM-P	20	CFM-P						
55	20	CFM-P	20	CFM-P						
60	20	CFM-P	20	CFM-P						
65	20	CFM-P	20	CFM-P						
70	20	CFM-P	20	CFM-P						
75	20	CFM-P	20	CFM-P						
80	20	CFM-P	20	CFM-P						
85	20	CFM-P	20	CFM-P						
90	20	CFM-P	20	CFM-P						
95	20	CFM-P	20	CFM-P						
100	20	CFM-P	20	CFM-P						
135	20	CFM-P	20	CFM-P						

Card 30----- Fan Airflows -----										
-----Main-----					-----Auxiliary-----					
-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Room Exhaust--		
Room	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	2675	CFM	2675	CFM						
10	3180	CFM	3180	CFM						
15	10917	CFM	10917	CFM					790	CFM
20	700	CFM	700	CFM						
25	800	CFM	800	CFM						
30	3025	CFM	3025	CFM						
35	845	CFM	845	CFM						
40	17300	CFM	17300	CFM						
45	9060	CFM	9060	CFM						
50	1100	CFM	1100	CFM						
55	1570	CFM	1570	CFM						
60	1910	CFM	1910	CFM						

Card 30----- Fan Airflows -----										
-----Main-----					-----Auxiliary-----					
Room	----Cooling----		----Heating----		----Cooling----		----Heating----		--Room Exhaust--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
65	2905	CFM	2905	CFM						
70	3075	CFM	3075	CFM						
75	6840	CFM	6840	CFM						
80	5952	CFM	5952	CFM					3769	CFM
85	2339	CFM	2339	CFM						
90	4268	CFM	4268	CFM						
95	3824	CFM	3824	CFM						
100	12518	CFM	12518	CFM						
105	8643	CFM	8643	CFM						
110	11962	CFM	11962	CFM						
115	4780	CFM	4780	CFM						
120	7526	CFM	7526	CFM						
125	7467	CFM	7467	CFM						
130	8800	CFM	8800	CFM						
135	11513	CFM	11513	CFM						
140	5409	CFM	5409	CFM						
145	10620	CFM	10620	CFM						
150	8893	CFM	8893	CFM						
155	23005	CFM	23005	CFM						

Card 31----- Partition Parameters -----										
Room	Partition	Partition	Partition	Partition	Const	Temp	Cooling	Heating	Adjacent	
Number	Number	Length	Height	U-Value	Type	Flag	Temp	Temp	Room No	
5	1	43	43	.18	110	CONSTANT	63	63		
10	1	68.5	68.5	.18	110	CONSTANT	63	63		
15	1	92.5	93	.18	110	CONSTANT	63	63		
20	1	26.5	26.5	0.18	110	CONSTANT	63	63		
25	1	27.5	27	0.18	110	CONSTANT	63	63		
30	1	55.5	55.5	0.18	110	CONSTANT	63	63		
35	1	64	10	0.18	110	CONSTANT	63	63		
40	1	50	10	0.18	110	CONSTANT	63	63		
45	1	111.5	10	0.18	110	CONSTANT	63	63		
60	1	45	45	0.18	110	CONSTANT	63	63		
65	1	89.5	37	0.18	110	CONSTANT	71	55		
70	1	89.5	37	0.18	110	CONSTANT	71	55		
75	1	87	87	0.18	110	CONSTANT	71	55		
85	1	60	60	0.18	110	CONSTANT	71	55		

----- System Section Alternative #4 -----

## Card 39- System Alternative

Number	Description
1	EXISTING SECONDARY EQUIPMENT AND SYSTEMS

Card 40----- System Type -----  
 -----OPTIONAL VENTILATION SYSTEM-----

System Set Number	System Type	Ventil Deck Location	Cooling SADBvh	Heating SADBvh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	BPMZ						
2	BPMZ						
3	TRH						
4	TRH						
5	TRH						
6	BPMZ						
7	COMP						
8	COMP						
9	COMP						
10	COMP						
11	COMP						
12	COMP						
13	COMP						
14	TRH						

## Card 41----- Zone Assignment -----

System Set Number	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	3										
2	4	8										
3	9	9										
4	10	15										
5	16	19										
6	20	20										
7	21	21										
8	22	22										
9	23	23										
10	24	24										
11	25	25										
12	26	26										
13	27	27										
14	28	31										

## Card 42----- Fan SP and Duct Parameters-----

System Set Number	Cool Fan SP	Heat Fan SP	Return Fan SP	Mn Exh Fan SP	Aux Fan SP	Rm Exh Fan SP	Cool Fan Mtr Loc	Return Fan Mtr Loc	Supply Duct Ht Gn	Supply Duct Loc	Return Air Path
1	1.75			.127		1.0					
2	1.5			.326							
3	2.4			.208							

Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
4	2.5			.613							
5	3.45			.389		1.5					
6	2.1			.26							
7	0.92										
8	1.67										
9	0.64										
10	1.39										
11	1.54										
12	1.04										
13	1.64			.077							
14	3.25										

Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery -----						
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --		-- Control Type --		-- Exh-Side Deck --	
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2
1	DRY-BULB	65	3										
2	DRY-BULB	65	5.5										
3	DRY-BULB	65	8.8										
4	DRY-BULB	65	14										
5	DRY-BULB	65	9										
6	DRY-BULB	65	8										
7	DRY-BULB	65	2.4										

Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main				Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.		Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity		Coil
1	AVAIL	AVAIL									
2	AVAIL	AVAIL				OFF	OFF	OFF			
3	AVAIL	AVAIL				OFF	OFF	OFF			
4	AVAIL	AVAIL									
5	AVAIL	AVAIL									
6	AVAIL	AVAIL									
13	AVAIL	AVAIL				OFF	OFF	OFF			

Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1			OPSTART	OPSTOP					



Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
2			OPSTART	OPSTOP					
3			OPSTART	OPSTOP					
4			OPSTART	OPSTOP					
5			OPSTART	OPSTOP					
6			OPSTART	OPSTOP					

Card 47----- Fan Overrides -----

Sys	Clg	Htg	Ret	Mn Exh	Aux	Rm Exh	Opt Vnt	-----MAIN COOLING FAN-----				
Set	Fan	Fan	Fan	Fan	Fan	Fan	Sys Fan	Mech	Air	Air	Size	
Num	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Value	Units	Meth	Config
3												BLOW
4												BLOW
5												BLOW
14												BLOW

----- Equipment Section Alternative #4 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	---- Demand Limit ----		
Number	Time of Day	Time of Day	Limit	Temperature		
	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
1				EXISTING PRIMARY EQUIPMENT		

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	PKPLANT	1	14								

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref	Code	Of	--Capacity--	---Energy---	---Energy---	--Capacity--	---Energy---	---Energy---	Order	Seq	Limit		
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	1	SER	
2	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	2	SER	

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Value	Units	Value	Units	Value
1	39.3	KW	27.5	KW
2	0	KW	18.3	KW

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
1						85	65	HEATING
2						85	65	HEATING

## Card 65----- Heating Load Assignment -----

Load	All Coil
Assignment	Loads To
Reference	Heating Ref
1	3 5 14 14
2	3 7 13

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy	Seq	Switch	Demand
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	over
Number	Name	Units	Value	Units	Value	Units	Number
1	EQ2002	1	0	KW	100	PCTEFF	
2	EQ2002	1	0	KW	100	PCTEFF	
3	EQ2263	1					

## Card 69----- Fan Equipment Parameters -----

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	EQ4003			EQ4223		EQ4003	
2	EQ4003			EQ4223			
3	EQ4003			EQ4223			
4	EQ4003			EQ4223			
5	EQ4003			EQ4223		EQ4003	
6	EQ4003			EQ4223			
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						
11	EQ4003						
12	EQ4003						
13	EQ4003			EQ4223			

## Card 69----- Fan Equipment Parameters -----

System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
14	EQ4003						

## Card 70----- Fan Equipment KW Overrides -----

System	-----MAIN SYSTEM-----				--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY---				
	Cool	Heat	Ret	Exh	Aux	Room	Opt	Cool	Heat	Aux	Room	Opt
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Fan	Fan	Fan	Fan	Fan
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	6.5			.25		1.2						
2	10.2			.652								
3	6.5			.415								
4	17.3			1.225								
5	13.9			.779		2.7						
6	7.4			.519								
7	3.3											
8	5.6											
9	1.8											
10	3.7											
11	4.7											
12	3.3											
13	5.6			.156								
14	22.7											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving	
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp	
1	CHW PIPING LOSS	4.64	TONS	AVAIL	CHILL-LD	1				
2	HW PIPING LOSS	77.4	MBH	AVAIL	HOT-LD	1				

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower	Cooling	Capacity	Capacity	Energy		Fluid	Tower	Number	Percent	Low Spd	Low Spd
				Consump	Consump						
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Airflow	Energy	Energy
									Low Spd	Value	Units
1	EQ5100			12.5	KW	T-WATER	CTOWER	1			
2	EQ5100			10.8	KW	T-WATER	CTOWER	1			

## Card 75----- Miscellaneous Accessory -----

Misc	#1	Energy	Energy	Sched	#2	Energy	Energy	Sched	#3	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
1	EQ5020	16.6	KW	DAYSCHED								

## 01 Card - Job Information

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Project: EEAP ENERGY STUDY - HELSTF  
 Location: WHITE SANDS - ALAMOGORDO, NEW MEXICO  
 Client: FORT WORTH CORPS OF ENGINEERS  
 Program User: HUITT-ZOLLARS, INC.  
 Comments: LSTC BUILDING

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
HOLLOMAN								

## ----- Load Section Alternative #1 -----

**ECO-D, LSTC BUILDING**

## Card 19- Load Alternative -

Number	Description
1	ECO D - VAV RETROFIT

## Card 20----- General Room Parameters -----

Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
5	1	B-17 B,C,& D	25.5	59.5	10	2		10			
10	2	B-17,18,AEROBICS	59	59.5	10	2		10			
15	3	B-8,16,27-32	80.5	80.5	10	2		10			
20	4	B-25,25A	22	15	10	2		10			
25	5	B-4	27	27.5	10	2		10			
30	6	B-12,12A	55.5	55.5	10	2		10			
35	7	B-2,13,19,20-22	45.5	45.5	10	2		10			
40	8	B-1,3,24	81	81	10	2		10			
45	9	B-9,10,11,11A	111.5	20	10	2		10			
50	10	DOMES,MAIN WINGS	40	40.5	10	2		10			
55	11	SW LOWER DOME	48	48	10	2		10			
60	12	NE LOWER DOME	48	48	10	2		10			
65	13	MAIN FLR WEST	89.5	37	10	2		10			
70	14	MAIN FLR EAST	61	61	10	2		10			
75	15	112,119A,123A,	94.5	95	10	2		10			
80	16	MAIN FLOOR CENTR	93	93.5	10	2		10			
85	17	MAIN FLOOR SOUTH	51	51	10	2		10			

Card 20----- General Room Parameters -----											
Room	Zone	Room	Floor	Floor	Const	Plenum	Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Number	Reference	Descrip	Length	Width	Type	Height	Ceiling	Floor	Floors	Rooms per	Depth
	Number						Resistance	Height	Multiplier	Zone	
90	18	L.DOME COMP. RMS.	63.5	63.5	10	2		10			
95	19	L.DOME OFFICES	71	71	10	2		10			
100	20	U.DOME	88.5	88.5	10	2		10			
105	21	RM 119, AH-8	1	1							
110	22	RM 119A, AH-9	1	1							
115	23	RM 123, AH-10	1	1							
120	24	RM 127A, AH-11A	1	1							
125	25	RM 127A, AH-11B	1	1							
130	26	RM 127, AH-12	1	1							
135	27	AUX CNTRL, AH-14	1	1							
140	28	RM 110 UNDERFLOR	33	34	10	2		10			
145	29	RM 120A,122,126A	50	50	10	2		10			
150	30	RM 146A,148,148A	32	32	10	2		10			
155	31	204,205,206,207	63.5	63.5	10	2		10			

Card 21----- Thermostat Parameters -----											
Room	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet	
Number	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On	
	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor	
5	75	50	75		70	70			HEAVY130	NO	
10	75	50	75		70	70			HEAVY130	NO	
15	75	50	75		70	70			HEAVY130	NO	
20	75	50	75		70	70			HEAVY130	NO	
25	75	50	75		70	70			HEAVY130	NO	
30	75	50	75		70	70			HEAVY130	NO	
35	75	50	75		70	70			HEAVY130	NO	
40	75	50	75		70	70			HEAVY130	NO	
45	70	45	70		70	70			HEAVY130	NO	
50	75	50	75		70	70			HEAVY130	NO	
55	75	50	75		70	70			HEAVY130	NO	
60	75	50	75		70	70			HEAVY130	NO	
65	75	50	75		70	70			HEAVY130	NO	
70	75	50	75		70	70			HEAVY130	NO	
75	75	50	75		70	70			HEAVY130	NO	
80	70	45	70		70	70			HEAVY130	NO	
85	75	50	75		70	70			HEAVY130	NO	
90	70	45	70		70	70			HEAVY130	NO	
95	75	50	75		70	70			HEAVY130	NO	
100	75	50	75		70	70			HEAVY130	NO	
105	70	45	70		70	70					
110	70	45	70		70	70					
115	70	45	70		70	70					
120	70	45	70		70	70					
125	70	45	70		70	70					
130	70	45	70		70	70					

## Card 21----- Thermostat Parameters -----

	Cooling	Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
135	70	45	70		70	70				
140	70	45	70		70	70				
145	70	45	70		70	70				
150	70	45	70		70	70				
155	70	45	70		70	70				

## Card 22----- Roof Parameters -----

	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Room	Roof	Equal to	Roof	Roof	Roof	Type	Direction	Tilt	Alpha
Number	Number	Floor?	Length	Width	U-Value				
50	1	YES			0.18	19			.4
100	1	NO	88	88	0.18	19			.4

## Card 24----- Wall Parameters -----

	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Room	Wall	Length	Height	U-Value	Constuc	Direction	Tilt	Alpha	Reflectance
Number	Number				Type				Multiplier
50	1	26.5	31	0.18	94	0		.4	
50	2	26.5	31	0.18	94	90		.4	
50	3	26.5	31	0.18	94	180		.4	
50	4	26.5	31	0.18	94	270		.4	
55	1	42	15	0.18	94	0		.4	
55	2	42	15	0.18	94	90		.4	
55	3	42	15	0.18	94	180		.4	
55	4	42	15	0.18	94	270		.4	
60	1	42	15	0.18	94	0		.4	
60	2	42	15	0.18	94	90		.4	
60	3	42	15	0.18	94	180		.4	
60	4	42	15	0.18	94	270		.4	
90	1	37.5	10	0.18	94	0		.4	
90	2	37.5	10	0.18	94	90		.4	
90	3	37.5	10	0.18	94	180		.4	
90	4	37.5	10	0.18	94	270		.4	
95	1	47	10	0.18	94	0		.4	
95	2	47.5	10	0.18	94	90		.4	
95	3	47	10	0.18	94	180		.4	
95	4	47.5	10	0.18	94	270		.4	
100	1	78	29	0.18	94	0		.4	
100	2	78.5	29	0.18	94	90		.4	
100	3	78	29	0.18	94	180		.4	
100	4	78.5	29	0.18	94	270		.4	

Card 26----- Schedules -----										
Room					Reheat	Cooling	Heating	Auxiliary	Room	Daylighting
Number	People	Lights	Ventilation	Infiltration	Minimum	Fans	Fan	Fan	Exhaust	Controls
5	OFFICEP1	OFFICEL7				DAYSCHED				
10	OFFICEP1	OFFICEL8				DAYSCHED				
15	OFFICEP1	OFFICEL9				DAYSCHED			DAYSCHED	
20		OFICEL10				DAYSCHED				
25		OFICEL11				DAYSCHED				
30	OFFICEP1	OFICEL12				DAYSCHED				
35	OFFICEP1	OFICEL13				DAYSCHED				
40		CLGONLY				DAYSCHED				
45	OFFICEP1	OFICEL14				DAYSCHED				
50	OFFICEP1	CLGONLY				DAYSCHED				
55	OFFICEP1	OFICEL15				DAYSCHED				
60	OFFICEP1	OFICEL16				DAYSCHED				
65	OFFICEP1	OFICEL17				DAYSCHED				
70	OFFICEP1	OFICEL18				DAYSCHED				
75	OFFICEP1	OFICEL19				DAYSCHED				
80	OFFICEP1	OFICEL20				DAYSCHED			DAYSCHED	
85	OFFICEP1	OFICEL21				DAYSCHED				
90	OFFICEP1	OFFICEL7				DAYSCHED				
95	OFFICEP1	OFICEL22				DAYSCHED				
100	OFFICEP1	OFICEL23				DAYSCHED				
105	CLGONLY									
110	CLGONLY									
115	CLGONLY									
120	CLGONLY									
125	CLGONLY									
130	CLGONLY									
135	CLGONLY									
140	CLGONLY									

Card 27----- People and Lights -----												
Room	People	People	People	People	Lighting	Lighting	Lighting	Percent	--- Daylighting ---			
Number	Value	Units	Sensible	Latent	Value	Units	Fixture Type	Ballast Factor	Lights to Ret. Air	Reference Point 1	Reference Point 2	
5	7	PEOPLE	250	200	1876	WATTS	ASHRAE1					
10	3	PEOPLE	250	200	3263	WATTS	SUSFLUOR					
15	2	PEOPLE	250	200	7204	WATTS	SUSFLUOR					
20					375	WATTS	SUSFLUOR					
25					2060	WATTS	SUSFLUOR					
30	2	PEOPLE	250	200	2683	WATTS	ASHRAE1					
35					1115	WATTS	ASHRAE1					
40					3683	WATTS	ASHRAE1					
45	3	PEOPLE	250	200	4838	WATTS	ASHRAE1					
50	1	PEOPLE	250	200	374	WATTS	ASHRAE1					
55	1	PEOPLE	250	200	2870	WATTS	ASHRAE1					
60	3	PEOPLE	250	200	3024	WATTS	ASHRAE1					
65	7	PEOPLE	250	200	5967	WATTS	SUSFLUOR					
70	13	PEOPLE	250	200	3463	WATTS	ASHRAE1					
75	15	PEOPLE	250	200	13978	WATTS	ASHRAE1					

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	Percent --- Daylighting --- Reference Point 1	Reference Point 2
80	12	PEOPLE	250	200	11936	WATTS	ASHRAE1				
85	11	PEOPLE	250	200	4403	WATTS	ASHRAE1				
90	16	PEOPLE	250	200	5302	WATTS	ASHRAE1				
95	18	PEOPLE	250	200	6382	WATTS	ASHRAE1				
100	19	PEOPLE	250	200	9998	WATTS	ASHRAE1				
105	1	PEOPLE	250	200							
110	1	PEOPLE	250	200							
115	1	PEOPLE	250	200							
120	1	PEOPLE	250	200							
125	1	PEOPLE	250	200							
130	1	PEOPLE	250	200							
135	4	PEOPLE	250	200							
140	1	PEOPLE	250	200							

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment Number	Misc Equipment Descrip	Energy Consump Value	Energy Consump Units	Energy Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
5	1	TYP. OFFICE EQ.	8500	WATTS	OFFICEL1						
10	1	TYP. OFFICE EQ.	1430	WATTS	OFFICEL1						
15	1	TYP. OFFICE EQ.	13814	WATTS	CLGONLY						
20	1	ELEV. MOTOR	6230	WATTS	CLGONLY						
30	1	OFFICE, LIGHT EQ	4636	WATTS	OFFICEL1						
40	1	MISC. EQ.	13132	WATTS	CLGONLY						
45	1	TYP OFFICE EQ	4250	WATTS	OFFICEL1						
55	1	TYP OFFICE EQ	830	WATTS	OFFICEL1						
60	1	TYP OFFICE EQ	7140	WATTS	OFFICEL1						
65	1	TYP OFFICE EQ	9040	WATTS	OFFICEL1						
70	1	TYP OFFICE EQ	12445	WATTS	OFFICEL1						
85	1	TYP OFFICE EQ	9220	WATTS	OFFICEL1						
90	1	TYP OFFICE EQ	4980	WATTS	CLGONLY						
95	1	TYP OFFICE EQ	23580	WATTS	OFFICEL1						
100	1	MISC. OFFICE EQ	32541	WATTS	OFFICEL2						
105	1	COMPUTERS - UPS	5995	WATTS	OFFICEM1	ELEC					
110	1	COMPUTERS - UPS	7194	WATTS	OFFICEM1	ELEC					
115	1	COMPUTERS - UPS	4700	WATTS	OFFICEM1	ELEC					
120	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC					
125	1	COMPUTERS - UPS	3561	WATTS	OFFICEM1	ELEC					
130	1	COMPUTERS - UPS	7320	WATTS	OFFICEM1	ELEC					
135	1	COMPUTERS - UPS	2214	WATTS	OFFICEM1	ELEC					
140	1	COMPUTERS - UPS	4892	WATTS	OFFICEM1	ELEC					
145	1	COMPUTERS - UPS	10978	WATTS	OFFICEM1	ELEC					
150	1	COMPUTERS - UPS	4434	WATTS	OFFICEM1	ELEC					
155	1	COMPUTERS - UPS	17545	WATTS	OFFICEM1	ELEC					



Card 29-----Room Airflows-----										
-----Ventilation-----					-----Infiltration-----					
Room Number	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	20	CFM-P	20	CFM-P						
10	20	CFM-P	20	CFM-P						
20	20	CFM-P	20	CFM-P						
25	20	CFM-P	20	CFM-P						
30	20	CFM-P	20	CFM-P						
35	20	CFM-P	20	CFM-P						
40	20	CFM-P	20	CFM-P						
45	20	CFM-P	20	CFM-P						
50	20	CFM-P	20	CFM-P						
55	20	CFM-P	20	CFM-P						
60	20	CFM-P	20	CFM-P						
65	20	CFM-P	20	CFM-P						
70	20	CFM-P	20	CFM-P						
75	20	CFM-P	20	CFM-P						
80	20	CFM-P	20	CFM-P						
85	20	CFM-P	20	CFM-P						
90	20	CFM-P	20	CFM-P						
95	20	CFM-P	20	CFM-P						
100	20	CFM-P	20	CFM-P						
135	20	CFM-P	20	CFM-P						

Card 30-----Fan Airflows-----										
-----Main-----					-----Auxiliary-----				--Room Exhaust--	
Room Number	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		Value	Units
	Value	Units	Value	Units	Value	Units	Value	Units		
15									790	CFM
80									3769	CFM
105	8643	CFM	8643	CFM						
110	11962	CFM	11962	CFM						
115	4780	CFM	4780	CFM						
120	7526	CFM	7526	CFM						
125	7467	CFM	7467	CFM						
130	8800	CFM	8800	CFM						
135	11513	CFM	11513	CFM						

Card 31-----Partition Parameters-----										
Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No	
5	1	43	43	.18	110	CONSTANT	63	63		
10	1	68.5	68.5	.18	110	CONSTANT	63	63		
15	1	92.5	93	.18	110	CONSTANT	63	63		
20	1	26.5	26.5	0.18	110	CONSTANT	63	63		
25	1	27.5	27	0.18	110	CONSTANT	63	63		
30	1	55.5	55.5	0.18	110	CONSTANT	63	63		

Card 31----- Partition Parameters -----

Room Number	Partition Number	Partition Length	Partition Height	Partition U-Value	Const Type	Temp Flag	Cooling Temp	Heating Temp	Adjacent Room No
35	1	64	10	0.18	110	CONSTANT	63	63	
40	1	50	10	0.18	110	CONSTANT	63	63	
45	1	111.5	10	0.18	110	CONSTANT	63	63	
60	1	45	45	0.18	110	CONSTANT	63	63	
65	1	89.5	37	0.18	110	CONSTANT	71	55	
70	1	89.5	37	0.18	110	CONSTANT	71	55	
75	1	87	87	0.18	110	CONSTANT	71	55	
85	1	60	60	0.18	110	CONSTANT	71	55	

----- System Section Alternative #1 -----

## Card 39- System Alternative

Number	Description
1	EXISTING SECONDARY EQUIPMENT AND SYSTEMS

## Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System Set	System	Ventil Deck	Cooling	Heating	Cooling	Heating	Fan Static
Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
1	BPMZ						
2	BPMZ						
3	VRH						
4	VRH						
5	VRH						
6	BPMZ						
7	COMP						
8	COMP						
9	COMP						
10	COMP						
11	COMP						
12	COMP						
13	COMP						
14	VRH						

## Card 41----- Zone Assignment -----

System Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	3										
2	4	8										

## Card 41----- Zone Assignment -----

System

Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
3	9	9										
4	10	15										
5	16	19										
6	20	20										
7	21	21										
8	22	22										
9	23	23										
10	24	24										
11	25	25										
12	26	26										
13	27	27										
14	28	31										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.75			.127		1.0					
2	1.5			.326							
3	2.4			.208							
4	2.5			.613							
5	3.45			.389		1.5					
6	2.1			.26							
7	0.92										
8	1.67										
9	0.64										
10	1.39										
11	1.54										
12	1.04										
13	1.64			.077							
14	3.25										

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery -----					
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --	-- Control Type --	-- Exh-Side Deck --		
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1
1	DRY-BULB	65	3									
2	DRY-BULB	65	5.5									
3	DRY-BULB	65	8.8									
4	DRY-BULB	65	14									
5	DRY-BULB	65	9									
6	DRY-BULB	65	8									
7	DRY-BULB	65	2.4									

Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	AVAIL	AVAIL				OFF	OFF	OFF		
2	AVAIL	AVAIL				OFF	OFF	OFF		
3	AVAIL	AVAIL								
4	AVAIL	AVAIL								
5	AVAIL	AVAIL								
6	AVAIL	AVAIL				OFF	OFF	OFF		
13	AVAIL	AVAIL								

Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1			OPSTART	OPSTOP					
2			OPSTART	OPSTOP					
3			OPSTART	OPSTOP					
4			OPSTART	OPSTOP					
5			OPSTART	OPSTOP					
6			OPSTART	OPSTOP					

Card 47----- Fan Overrides -----

Sys	Clg	Htg	Ret	Mn Exh	Aux	Rm Exh	Opt Vnt	-----MAIN COOLING FAN-----			
Set	Fan	Fan	Fan	Fan	Fan	Fan	Sys Fan	Mech	Air	Air	Size
Num	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Eff	Value	Units	Meth
3											Config
4											BLOW
5											BLOW
14											BLOW

----- Equipment Section Alternative #1 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	----- Demand Limit -----		
Number	Time of Day	Time of Day	Limit	Schedule	Temperature	Drift
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
1				EXISTING PRIMARY EQUIPMENT		

## Card 60----- Cooling Load Assignment-----

Load All Coil Cooling

Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1	PKPLANT	1	14							

## Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand	
Ref	Code	Of	--Capacity--	-----Energy----	--Capacity--	-----Energy----	Order	Seq	Limit			
Num	Name	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number	
1	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	1	SER
2	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	2	SER

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-
Ref	Full Load	Full Load	Full Load	Full Load
Num	Value	Units	Value	Units
1	39.3	KW	27.5	KW
2	0	KW	18.3	KW

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
1						85	65	HEATING
2						85	65	HEATING

## Card 65----- Heating Load Assignment -----

Load All Coil

Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Reference	Heating Ref	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1	3	5	14	14					
2	3	7	13							

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy	Seq	Switch	Demand
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	over
Number	Name	Units	Value	Units	Value	Units	Number
1	EQ2002	1	0	KW	100	PCTEFF	
2	EQ2002	1	0	KW	100	PCTEFF	
3	EQ2263	1					

## Card 69----- Fan Equipment Parameters -----

System	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Set	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
Number							
1	EQ4223			EQ4223		EQ4003	
2	EQ4223			EQ4223			
3	EQ4223			EQ4223			
4	EQ4223			EQ4223			
5	EQ4223			EQ4223		EQ4003	
6	EQ4223			EQ4223			
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						
11	EQ4003						
12	EQ4003						
13	EQ4003			EQ4223			
14	EQ4223						

## Card 70----- Fan Equipment KW Overrides -----

System	-----MAIN SYSTEM-----				--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY----				
	Cool	Heat	Ret	Exh	Aux	Room	Opt	Cool	Heat	Aux	Room	Opt
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	6.5			.246			1.2					
2	10.2			.635								
3	6.5			.405								
4	17.3			1.19								
5	13.9			.759		2.7						
6	7.4			.506								
7	3.3											
8	5.6											
9	1.8											
10	3.7											
11	4.7											
12	3.3											
13	5.6			.15								
14	22.7											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW PIPING LOSS	4.64	TONS	AVAIL	CHILL-LD	1			
2	HW PIPING LOSS	77.4	MBH	AVAIL	HOT-LD	1			

## Card 74----- Condenser / Cooling Tower Parameters -----

Tower	Cooling	Capacity	Capacity	Energy	Energy	Fluid	Tower	Number	Percent	Low Spd	Low Spd
				Consump	Consump						
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Airflow	Energy	Energy
1	EQ5100			12.5	KW	T-WATER	CTOWER	1			

Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy			Number		Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
2	EQ5100			10.8	KW	T-WATER	CTOWER	1			

Card 75----- Miscellaneous Accessory -----

#1				#2				#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
1	EQ5020	16.6	KW	DAYSCHED								

----- Equipment Section Alternative #2 -----

## ECO-E, LSTC BUILDING

Card 59----- Equipment Description / TOD Schedules -----

		Elec Consump	Elec Demand	Demand Limit	
Alternative	Time of Day	Time of Day	Limit		Temperature
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule Drift
2				ECO E MOTOR REPLMNT	

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling									
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1	PKPLANT	1	14							

Card 62----- Cooling Equipment Parameters -----

Cool Equip		Num	COOLING				HEAT RECOVERY				Seq	Demand	
Ref	Code	Of	--Capacity--	--Energy--		--Capacity--	--Energy--		Order	Seq	Limit		
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	1	SER	
2	EQ1010S	1	154	TONS	142	KW	91	TONS	88	KW	2	SER	

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---		---HT REC or AUX---		Switch-			Cold	Cooling	Misc.
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Storage	Tower	Access.
Num	Value	Units	Value	Units	Value	Units	Value	Units	Control		
1	38.9	KW	24.8	KW						1	1
2	0	KW	17.7	KW						2	

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min. Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
1						85	65	HEATING
2						85	65	HEATING

## Card 65----- Heating Load Assignment -----

Load	All Coil										
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	3	5	14	14						
2	3	7	13								

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy	Seq	Switch					Demand
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	over	Hot	Misc.	Limit	
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg
1	EQ2002	1	0	KW			100	PCTEFF			
2	EQ2002	1	0	KW			100	PCTEFF			
3	EQ2263	1									

## Card 69----- Fan Equipment Parameters -----

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	EQ4223			EQ4223		EQ4003	
2	EQ4223			EQ4223			
3	EQ4223			EQ4223			
4	EQ4223			EQ4223			
5	EQ4223			EQ4223		EQ4003	
6	EQ4223			EQ4223			
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						
11	EQ4003						
12	EQ4003						
13	EQ4003			EQ4223			
14	EQ4223						



## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----								--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY----		
System	Cool	Heat	Ret	Exh	Aux	Room	Opt				Room	Opt	
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent	
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan	
1	6.0			.25			1.1						
2	9.7			.652									
3	6.0			.415									
4	16.6			1.225									
5	13.3			.779			2.4						
6	7.2			.519									
7	3.1												
8	5.0												
9	1.7												
10	3.5												
11	4.4												
12	3.1												
13	5.0			.156									
14	22.3												

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW PIPING LOSS	4.64	TONS	AVAIL	CHILL-LD	1			
2	HW PIPING LOSS	77.4	MBH	AVAIL	HOT-LD	1			

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value
1	EQ5100			12.0	KW	T-WATER	CTOWER	1		
2	EQ5100			10.4	KW	T-WATER	CTOWER	1		

## Card 75----- Miscellaneous Accessory -----

#1					#2					#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched		
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code		
1	EQ5020	15.7	KW	DAYSCHED										

## ----- Equipment Section Alternative #3 -----

**ECO-F, LSTC BUILDING**

## Card 59----- Equipment Description / TOD Schedules -----

Elec Consump				Elec Demand		Demand		---- Demand Limit ---			
Alternative	Time of Day	Time of Day	Limit					Temperature			
Number	Schedule	Schedule	Max KW	Alternative	Description			Schedule	Drift		

Card 60----- Cooling Load Assignment-----  
 Load All Coil Cooling  
 Asgn Loads To Equipment -Group 1- -Group 2- -Group 3- -Group 4- -Group 5- -Group 6- -Group 7- -Group 8- -Group 9-  
 Ref Cool Ref Sizing Begin End Begin End Begin End Begin End Begin End Begin End Begin End Begin End  
 1 1 PKPLANT 1 14

Card 62----- Cooling Equipment Parameters -----  

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand
Ref Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq Limit
Num Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type Number
1 YWCRECIP	1	59	TONS	50	KW					1	PAR
2 YCENT123	1	180	TONS	122	KW					2	PAR

Card 63----- Cooling Pumps and References -----  

Cool	---CHILLED WATER---				-----CONDENSER-----		---HT REC or AUX---		Switch		
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Value	Control	Storage	Tower	Access.
1	3.23	KW	5.58	KW				1		1	
2	9.35	KW	12.2	KW				1		2	

Card 65----- Heating Load Assignment -----  
 Load All Coil  
 Assignment Loads To -Group 1- -Group 2- -Group 3- -Group 4- -Group 5- -Group 6- -Group 7- -Group 8- -Group 9-  
 Reference Heating Ref Begin End Begin End Begin End Begin End Begin End Begin End Begin End Begin End  
 1 1 3 5 14 14  
 2 2 7 13

Card 67----- Heating Equipment Parameters -----  

Heat	Equip	Number	HW Pmp	Energy		Seq	Switch	Demand		
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	over	Hot	Misc.	Limit
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control Strg Acc. Cogen Number
1	OILBLR	1	.51	KW	720	MBH	900	MBH		
2	EQ2263	1								

Card 69----- Fan Equipment Parameters -----  
 System  

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	EQ4223					EQ4003	
2	EQ4223						
3	EQ4223						

## Card 69----- Fan Equipment Parameters -----

System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
4	EQ4223			EQ4223			
5	EQ4223			EQ4223		EQ4003	
6	EQ4223			EQ4223			
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						
11	EQ4003						
12	EQ4003						
13	EQ4003			EQ4223			
14	EQ4223						

## Card 70----- Fan Equipment KW Overrides -----

System	-----MAIN SYSTEM-----							--OTHER SYSTEM--		-----DEMAND LIMIT PRIORITY---			
	Cool	Heat	Ret	Exh	Aux	Room	Opt			Room	Opt		
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent	
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan	
1	6.0			.25		1.1							
2	9.7			.652									
3	6.0			.415									
4	16.6			1.225									
5	13.3			.779		2.4							
6	7.2			.519									
7	3.1												
8	5.0												
9	1.7												
10	3.5												
11	4.4												
12	3.1												
13	5.0			.156									
14	22.3												

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW PIPING LOSS	4.64	TONS	AVAIL	CHILL-LD	1			
2	HW PIPING LOSS	77.4	MBH	AVAIL	HOT-LD	1			

## Card 72-- Switchover Controls -----

			Outside	
Control	Load	Load	Air	Sched
Reference	Value	Units	DB	Code
1	60	TONS		

Card 74-----				Condenser / Cooling Tower Parameters -----							
	Cooling			Energy	Energy			Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			12.0	KW	T-WATER	CTOWER	1			
2	EQ5100			10.4	KW	T-WATER	CTOWER	1			

## Utility Description Reference Table

## Schedules:

AVAIL AVAILABLE (100%)  
CLGONLY COOLING ONLY (DESIGN)  
DAYSCHED COOLING FAN SCHEDULE CODE  
OFF ALWAYS OFF  
OFFICEL1 TYPICAL OFFICE SCHEDULE FOR LIGHTING  
OFFICEL2 TYPICAL OFFICE SCHEDULE 1 LIGHTING-25%  
OFFICEL7 TYPICAL OFFICE SCHEDULE 1-OCC. SEN ECO  
OFFICEL8 TYPICAL OFFICE SCHEDULE 2-OCC. SEN ECO  
OFFICEL9 TYPICAL OFFICE SCHEDULE 3-OCC. SEN ECO  
OFFICEM1 TYPICAL UPS MISCELLANEOUS EQ. SCHEDULE  
OFFICEP1 TYPICAL OFFICE SCHEDULE FOR PEOPLE  
OFICEL10 TYPICAL OFFICE SCHEDULE 4-OCC. SEN ECO  
OFICEL11 TYPICAL OFFICE SCHEDULE 5-OCC. SEN ECO  
OFICEL12 TYPICAL OFFICE SCHEDULE 6-OCC. SEN ECO  
OFICEL13 TYPICAL OFFICE SCHEDULE 6-OCC. SEN ECO  
OFICEL14 TYPICAL OFFICE SCHEDULE 7-OCC. SEN ECO  
OFICEL15 TYPICAL OFFICE SCHEDULE 8-OCC. SEN ECO  
OFICEL16 TYPICAL OFFICE SCHEDULE 9-OCC. SEN ECO  
OFICEL17 TYPICAL OFFICE SCHEDULE 10OCC. SEN ECO  
OFICEL18 TYPICAL OFFICE SCHEDULE 11OCC. SEN ECO  
OFICEL19 TYPICAL OFFICE SCHEDULE 12OCC. SEN ECO  
OFICEL20 TYPICAL OFFICE SCHEDULE 13OCC. SEN ECO  
OFICEL21 TYPICAL OFFICE SCHEDULE 14OCC. SEN ECO  
OFICEL22 TYPICAL OFFICE SCHEDULE 15OCC. SEN ECO  
OFICEL23 TYPICAL OFFICE SCHEDULE 16OCC. SEN ECO  
OPSTART OPTIMUM START COOLING FAN SCHED. CODE  
OPSTOP OPTIMUM STOP COOLING FAN SCHED. CODE

## System:

BPMZ BYPASS MULTIZONE  
COMP COMPUTER ROOM UNIT  
VRH VARIABLE VOLUME REHEAT

## Equipment:

## Cooling:

EQ1010S 2-STG CTV<190 TONS W\HT REC(95 DEG HW)  
YCENT123 YORK CENT. R-123 CHILLER  
YWCRECIP YORK W.C. RECIP. CHILL.

## Heating:

EQ2002 GAS FIRED STEAM BOILER  
EQ2263 ELECTRIC RESISTANCE HEAT WITH FAN  
OILBLR OIL FIRED HOT WATER BOILER

## Fan:

EQ4003 FC CENTRIFUGAL - CONSTANT VOLUME  
EQ4223 FC FAN W\ARIABLE SPEED DRIVE

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5020 HEATING WATER CIRCULATION PUMP

```
*****
*****
**
**          T R A C E    6 0 0    A N A L Y S I S          **
**
**          by  HUITT & ZOLLARS          **
**
*****
*****
```

EEAP ENERGY STUDY - HELSTF  
WHITE SANDS - ALAMOGORDO, NEW MEXICO  
FORT WORTH CORPS OF ENGINEERS  
HUITT-ZOLLARS, INC.  
LSTC BUILDING

### EXISTING LSTC BUILDING

Weather File Code:

Location: HOLLoman AFB; ALAMAGORDO, N.M.  
Latitude: 33.0 (deg)  
Longitude: 106.0 (deg)  
Time Zone: 7  
Elevation: 4,093 (ft)  
Barometric Pressure: 25.6 (in. Hg)

Summer Clearness Number: 1.05  
Winter Clearness Number: 1.00  
Summer Design Dry Bulb: 96 (F)  
Summer Design Wet Bulb: 68 (F)  
Winter Design Dry Bulb: 19 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0648 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 0.9511 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,186.5 (Btu-min./hr/cuft)  
Enthalpy Factor: 3.8908 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 17:15: 0 1/ 2/96  
Dataset Name: LSTC .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING SECONDARY EQUIPMENT AND SYSTEMS

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	11.5	0	0	-169,241	0	0	10,171.0	0	0	0.0	0	0
5 - 10	23.1	0	0	-338,482	0	0	20,342.1	0	0	0.0	0	0
10 - 15	34.6	0	0	-507,723	0	0	30,513.2	0	0	0.0	0	0
15 - 20	46.2	0	0	-676,964	0	0	40,684.2	0	0	0.0	0	0
20 - 25	57.7	0	0	-846,205	16	1,415	50,855.3	0	0	0.0	0	0
25 - 30	69.3	0	0	-1,015,446	57	4,968	61,026.3	0	0	0.0	0	0
30 - 35	80.8	0	0	-1,184,687	27	2,377	71,197.4	0	0	0.0	0	0
35 - 40	92.4	0	0	-1,353,928	0	0	81,368.4	0	0	0.0	0	0
40 - 45	103.9	0	0	-1,523,169	0	0	91,539.5	0	0	0.0	0	0
45 - 50	115.5	0	0	-1,692,410	0	0	101,710.5	0	0	0.0	0	0
50 - 55	127.0	0	0	-1,861,651	0	0	111,881.6	0	0	0.0	0	0
55 - 60	138.5	3	227	-2,030,892	0	0	122,052.6	0	0	0.0	0	0
60 - 65	150.1	22	1,900	-2,200,133	0	0	132,223.7	0	0	0.0	0	0
65 - 70	161.6	19	1,647	-2,369,374	0	0	142,394.7	0	0	0.0	0	0
70 - 75	173.2	19	1,682	-2,538,615	0	0	152,565.8	0	0	0.0	0	0
75 - 80	184.7	21	1,801	-2,707,856	0	0	162,736.8	0	0	0.0	0	0
80 - 85	196.3	14	1,241	-2,877,097	0	0	172,907.9	0	0	0.0	0	0
85 - 90	207.8	3	262	-3,046,339	0	0	183,078.9	0	0	0.0	0	0
90 - 95	219.4	0	0	-3,215,579	0	0	193,250.0	0	0	0.0	0	0
95 - 100	230.9	0	0	-3,384,820	0	0	203,421.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	0	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Lighting Systems														
0	LIGHTS													
	ELEC	100893	91135	101273	97577	101083	97957	100702	101273	97577	101083	97577	100702	1,188,832
	PK	151.4	151.4	151.4	151.4	151.4	151.4	151.4	151.4	151.4	151.4	151.4	151.4	151.4
1	MISC LD													
	ELEC	26931	24324	26931	26062	26931	26062	26931	26931	26062	26931	26062	26931	317,085
	PK	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	BASE UTILITY													
	CHILLD	3452	3118	3452	3341	3452	3341	3452	3452	3341	3452	3341	3452	40,646
	PK	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
2	BASE UTILITY													
	HOTLD	576	520	576	557	576	557	576	576	557	576	557	576	6,780
	PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
1	EQ1010S	2-STG CTV<190 TONS W\HT REC(95 DEG HW) Chiller CH-1												
	ELEC	65518	59177	65518	63404	65518	63404	65518	65518	63404	65518	63404	65518	771,420
	PK	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-1A												
	ELEC	44	26	42	227	1482	5184	8151	8142	5449	740	20	33	29,539
	PK	2.0	2.1	2.2	4.3	8.1	12.5	12.5	12.5	12.5	5.7	2.1	2.0	12.5



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ5100	COOLING TOWER FANS											
	WATER	65	61	72	71	78	79	80	82	74	74	65	65
	PK	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-7											
	ELEC	29239	26410	29239	28296	29239	28296	29239	29239	28296	29239	28296	29239
	PK	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10A											
	ELEC	20460	18480	20460	19800	20460	19800	20460	20460	19800	20460	19800	20460
	PK	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
1	EQ5300	CONTROL PANEL & INTERLOCKS											
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-5											
	ELEC	12350	11155	12350	11952	12350	11952	12350	12350	11952	12350	11952	12350
	PK	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
2	EQ1010S	2-STG CTV<190 TONS W/HT REC(95 DEG HW) Chiller CH-3											
	ELEC	33193	32202	38611	41043	47302	51004	56556	56313	47456	42616	34370	34111
	PK	54.9	62.8	66.2	72.3	79.7	90.9	98.4	96.3	86.3	72.5	61.8	59.5
2	EQ5100	COOLING TOWER FANS Twr. Fan CT-1B											
	ELEC	3470	3499	4308	4811	5960	7122	8035	8031	7072	5262	3662	3608
	PK	6.5	7.3	7.5	9.1	10.8	10.8	10.8	10.8	10.8	9.7	6.9	7.0
2	EQ5100	COOLING TOWER FANS											
	WATER	169	167	203	218	254	269	292	291	251	227	178	175
	PK	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.3
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10B											
	ELEC	13615	12298	13615	13176	13615	13176	13615	13615	13176	13615	13176	13615
	PK	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
2	EQ5300	CONTROL PANEL & INTERLOCKS											
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AH1						56,940 6.5
	ELEC	4836	4368	4836	4680	4836	4680	4836	4836	4680	4836	4680	4836	
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan EF-1						10,512 1.2
	ELEC	893	806	893	864	893	864	893	893	864	893	864	893	
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AHS1						2,190 0.3
	ELEC	186	168	186	180	186	180	186	186	180	186	180	186	
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AH2						89,352 10.2
	ELEC	7589	6854	7589	7344	7589	7344	7589	7589	7344	7589	7344	7589	
	PK	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AHS1						5,712 0.7
	ELEC	485	438	485	469	485	469	485	485	469	485	469	485	
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AH3						56,940 6.5
	ELEC	4836	4368	4836	4680	4836	4680	4836	4836	4680	4836	4680	4836	
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AHS1						3,635 0.4
	ELEC	309	279	309	299	309	299	309	309	299	309	299	309	
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AH5						151,548 17.3
	ELEC	12871	11626	12871	12456	12871	12456	12871	12871	12456	12871	12456	12871	
	PK	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AHS1						10,731 1.2
	ELEC	911	823	911	882	911	882	911	911	882	911	882	911	
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AH6						121,764 13.9
	ELEC	10342	9341	10342	10008	10342	10008	10342	10342	10008	10342	10008	10342	
	PK	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan EF-2						23,652 2.7
	ELEC	2009	1814	2009	1944	2009	1944	2009	2009	1944	2009	1944	2009	
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	136	123	136	131	136	131	136	136	131	136	131	136
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH7											
	ELEC	5506	4973	5506	5328	5506	5328	5506	5506	5328	5506	5328	5506
	PK	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	386	349	386	374	386	374	386	386	374	386	374	386
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-8											
	ELEC	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455
	PK	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-9											
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-10											
	ELEC	1339	1210	1339	1296	1339	1296	1339	1339	1296	1339	1296	1339
	PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-11A											
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
11	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-11B											
	ELEC	3497	3158	3497	3384	3497	3384	3497	3497	3384	3497	3384	3497
	PK	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
12	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-12											
	ELEC	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455
	PK	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
13	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-14											
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
13	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	116	105	116	112	116	112	116	116	112	116	112	116
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
14	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AHS4						198,852
	ELEC	16889	15254	16889	16344	16889	16344	16889	16889	16344	16889	16344	16889	
	PK	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	
1	EQ2002	GAS FIRED STEAM BOILER												0
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ5020	HEATING WATER CIRCULATION PUMP												0
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ5240	BOILER FORCED DRAFT FAN												0
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ5307	CONTROLS												0
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ5061	CONDENSATE RETURN PUMP (HIGH EFFICIENCY)												0
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	EQ5406	MAKE-UP WATER												0
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	EQ2002	GAS FIRED STEAM BOILER												0
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	EQ5020	HEATING WATER CIRCULATION PUMP												0
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	EQ5240	BOILER FORCED DRAFT FAN												0
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2	EQ5307	CONTROLS												0
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2  
EXISTING SECONDARY EQUIPMENT AND SYSTEMS

----- SYSTEM LOAD PROFILE -----

**ECO-A, LSTC BUILDING**

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	11.5	0	0	-169,241	0	0	10,171.0	0	0	0.0	0	0
5 - 10	23.1	0	0	-338,482	0	0	20,342.1	0	0	0.0	0	0
10 - 15	34.6	0	0	-507,723	0	0	30,513.2	0	0	0.0	0	0
15 - 20	46.2	0	0	-676,964	0	0	40,684.2	0	0	0.0	0	0
20 - 25	57.7	0	0	-846,205	0	0	50,855.3	0	0	0.0	0	0
25 - 30	69.3	0	0	-1,015,446	35	3,053	61,026.3	0	0	0.0	0	0
30 - 35	80.8	0	0	-1,184,687	60	5,246	71,197.4	0	0	0.0	0	0
35 - 40	92.3	0	0	-1,353,928	5	461	81,368.4	0	0	0.0	0	0
40 - 45	103.9	0	0	-1,523,169	0	0	91,539.5	0	0	0.0	0	0
45 - 50	115.4	0	0	-1,692,410	0	0	101,710.5	0	0	0.0	0	0
50 - 55	127.0	0	0	-1,861,651	0	0	111,881.6	0	0	0.0	0	0
55 - 60	138.5	10	853	-2,030,892	0	0	122,052.6	0	0	0.0	0	0
60 - 65	150.0	27	2,404	-2,200,133	0	0	132,223.7	0	0	0.0	0	0
65 - 70	161.6	17	1,504	-2,369,374	0	0	142,394.7	0	0	0.0	0	0
70 - 75	173.1	21	1,837	-2,538,615	0	0	152,565.8	0	0	0.0	0	0
75 - 80	184.7	17	1,513	-2,707,856	0	0	162,736.8	0	0	0.0	0	0
80 - 85	196.2	7	629	-2,877,097	0	0	172,907.9	0	0	0.0	0	0
85 - 90	207.8	0	20	-3,046,339	0	0	183,078.9	0	0	0.0	0	0
90 - 95	219.3	0	0	-3,215,579	0	0	193,250.0	0	0	0.0	0	0
95 - 100	230.8	0	0	-3,384,820	0	0	203,421.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	0	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Lighting Systems													
0	LIGHTS												
	ELEC	63144	57037	63383	61068	63263	61308	63024	63383	61068	63263	61068	63024
	PK	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8
1	MISC LD												
	ELEC	26931	24324	26931	26062	26931	26062	26931	26931	26062	26931	26062	26931
	PK	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4
2	MISC LD												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD												
	OIL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD												
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD												
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD												
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY											
	CHILLD	3452	3118	3452	3341	3452	3341	3452	3452	3341	3452	3341	3452
	PK	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
2		BASE UTILITY											
	HOTLD	576	520	576	557	576	557	576	576	557	576	557	576
	PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
1	EQ1010S	2-STG CTV<190 TONS W/HT REC(95 DEG HW) Chiller CH-1											
	ELEC	65518	59177	65518	63404	65518	63404	65518	65518	63404	65518	63404	65518
	PK	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-1A											
	ELEC	0	0	0	49	999	4581	7862	7845	4871	358	0	0
	PK	0.6	0.8	1.0	3.2	7.4	12.5	12.5	12.5	12.5	4.8	0.7	0.6

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	43	41	49	49	56	58	58	60	53	52	43	43	605
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-7												
	ELEC	29239	26410	29239	28296	29239	28296	29239	29239	28296	29239	28296	29239	344,268
	PK	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10A												
	ELEC	20460	18480	20460	19800	20460	19800	20460	20460	19800	20460	19800	20460	240,900
	PK	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-5												
	ELEC	12350	11155	12350	11952	12350	11952	12350	12350	11952	12350	11952	12350	145,416
	PK	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
2	EQ1010S	2-STG CTV<190 TONS W/HT REC(95 DEG HW) Chiller CH-3												
	ELEC	31096	30001	35815	38216	44162	47699	53101	52555	44221	39656	32051	31977	480,549
	PK	48.4	57.7	62.7	68.6	75.3	86.7	94.0	92.0	81.6	68.9	57.6	55.5	94.0
2	EQ5100	COOLING TOWER FANS Twr. Fan CT-1B												
	ELEC	3028	3088	3838	4417	5630	6985	8018	7973	6912	4873	3221	3182	61,165
	PK	5.4	6.9	7.1	8.8	10.8	10.8	10.8	10.8	10.8	9.4	6.4	6.5	10.8
2	EQ5100	COOLING TOWER FANS												
	WATER	155	153	186	201	236	252	274	272	233	209	163	161	2,496
	PK	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.5
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10B												
	ELEC	13615	12298	13615	13176	13615	13176	13615	13615	13176	13615	13176	13615	160,308
	PK	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH1											
	ELEC	4836	4368	4836	4680	4836	4680	4836	4836	4680	4836	4680	4836
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-1											
	ELEC	893	806	893	864	893	864	893	893	864	893	864	893
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	186	168	186	180	186	180	186	186	180	186	180	186
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH2											
	ELEC	7589	6854	7589	7344	7589	7344	7589	7589	7344	7589	7344	7589
	PK	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	485	438	485	469	485	469	485	485	469	485	469	485
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH3											
	ELEC	4836	4368	4836	4680	4836	4680	4836	4836	4680	4836	4680	4836
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	309	279	309	299	309	299	309	309	299	309	299	309
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS5											
	ELEC	12871	11626	12871	12456	12871	12456	12871	12871	12456	12871	12456	12871
	PK	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	911	823	911	882	911	882	911	911	882	911	882	911
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH6											
	ELEC	10342	9341	10342	10008	10342	10008	10342	10342	10008	10342	10008	10342
	PK	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-2											
	ELEC	2009	1814	2009	1944	2009	1944	2009	2009	1944	2009	1944	2009
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7



## ----- EQUIPMENT ENERGY CONSUMPTION

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5	EQ4003	Fan AHS1												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	136	123	136	131	136	131	136	136	131	136	131	136	1,598
		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
6	EQ4003	Fan AH7												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	5506	4973	5506	5328	5506	5328	5506	5506	5328	5506	5328	5506	64,824
		7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
6	EQ4003	Fan AHS1												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	386	349	386	374	386	374	386	386	374	386	374	386	4,546
		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
7	EQ4003	Fan AH-8												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455	28,908
		3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
8	EQ4003	Fan AH-9												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166	49,056
		5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
9	EQ4003	Fan AH-10												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	1339	1210	1339	1296	1339	1296	1339	1339	1296	1339	1296	1339	15,768
		1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
10	EQ4003	Fan AH-11A												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753	32,412
		3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
11	EQ4003	Fan AH-11B												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	3497	3158	3497	3384	3497	3384	3497	3497	3384	3497	3384	3497	41,172
		4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
12	EQ4003	Fan AH-12												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455	28,908
		3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
13	EQ4003	Fan AH-14												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166	49,056
		5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
13	EQ4003	Fan AHS1												
	ELEC	FC CENTRIFUGAL - CONSTANT VOLUME												
	PK	116	105	116	112	116	112	116	116	112	116	112	116	1,367
		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
		Fan AHS4											
14	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME											
	ELEC	16889	15254	16889	16344	16889	16344	16889	16889	16344	16889	16344	16889
	PK	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
		Total											
		198,852											
1	EQ2002	GAS FIRED STEAM BOILER											
	GAS	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5240	BOILER FORCED DRAFT FAN											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5307	CONTROLS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5061	CONDENSATE RETURN PUMP (HIGH EFFICIENCY)											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5406	MAKE-UP WATER											
	WATER	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ2002	GAS FIRED STEAM BOILER											
	GAS	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5240	BOILER FORCED DRAFT FAN											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3  
EXISTING SECONDARY EQUIPMENT AND SYSTEMS

----- SYSTEM LOAD PROFILE -----

**ECO-B, LSTC BUILDING**

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	11.5	0	0	-169,241	0	0	10,171.0	0	0	0.0	0	0
5 - 10	23.1	0	0	-338,482	0	0	20,342.1	0	0	0.0	0	0
10 - 15	34.6	0	0	-507,723	0	0	30,513.2	0	0	0.0	0	0
15 - 20	46.2	0	0	-676,964	0	0	40,684.2	0	0	0.0	0	0
20 - 25	57.7	0	0	-846,205	0	0	50,855.3	0	0	0.0	0	0
25 - 30	69.3	0	0	-1,015,446	19	1,684	61,026.3	0	0	0.0	0	0
30 - 35	80.8	0	0	-1,184,687	39	3,419	71,197.4	0	0	0.0	0	0
35 - 40	92.3	0	0	-1,353,928	42	3,657	81,368.4	0	0	0.0	0	0
40 - 45	103.9	0	0	-1,523,169	0	0	91,539.5	0	0	0.0	0	0
45 - 50	115.4	0	0	-1,692,410	0	0	101,710.5	0	0	0.0	0	0
50 - 55	127.0	0	0	-1,861,651	0	0	111,881.6	0	0	0.0	0	0
55 - 60	138.5	17	1,513	-2,030,892	0	0	122,052.6	0	0	0.0	0	0
60 - 65	150.0	29	2,523	-2,200,133	0	0	132,223.7	0	0	0.0	0	0
65 - 70	161.6	17	1,469	-2,369,374	0	0	142,394.7	0	0	0.0	0	0
70 - 75	173.1	21	1,797	-2,538,615	0	0	152,565.8	0	0	0.0	0	0
75 - 80	184.7	12	1,093	-2,707,856	0	0	162,736.8	0	0	0.0	0	0
80 - 85	196.2	4	365	-2,877,097	0	0	172,907.9	0	0	0.0	0	0
85 - 90	207.8	0	0	-3,046,339	0	0	183,078.9	0	0	0.0	0	0
90 - 95	219.3	0	0	-3,215,579	0	0	193,250.0	0	0	0.0	0	0
95 - 100	230.8	0	0	-3,384,820	0	0	203,421.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	0	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS	Lighting Systems												
	ELEC	31826	28759	32604	30674	32215	31452	31437	32604	30674	32215	30674	31437	376,570
	PK	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8
1	MISC LD													
	ELEC	26931	24324	26931	26062	26931	26062	26931	26931	26062	26931	26062	26931	317,085
	PK	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLO	3452	3118	3452	3341	3452	3341	3452	3452	3341	3452	3341	3452	40,646
	PK	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
2		BASE UTILITY												
	HOTLD	576	520	576	557	576	557	576	576	557	576	557	576	6,780
	PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
1	EQ1010S	2-STG CTV<190 TONS W\HT REC(95 DEG HW) Chiller CH-1												
	ELEC	65518	59177	65518	63404	65518	63404	65518	65518	63404	65518	63404	65518	771,420
	PK	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-1A												
	ELEC	0	0	0	19	688	4288	7648	7643	4593	180	0	0	25,060
	PK	0.6	0.8	1.0	3.2	7.4	12.5	12.5	12.5	12.5	4.8	0.7	0.6	12.5

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip Num Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	27	27	34	35	41	44	43	45	38	37	28	27	427
	PK	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-7												
	ELEC	29239	26410	29239	28296	29239	28296	29239	29239	28296	29239	28296	29239	344,268
	PK	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10A												
	ELEC	20460	18480	20460	19800	20460	19800	20460	20460	19800	20460	19800	20460	240,900
	PK	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-5												
	ELEC	12350	11155	12350	11952	12350	11952	12350	12350	11952	12350	11952	12350	145,416
	PK	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
2	EQ1010S	2-STG CTV<190 TONS W/HT REC(95 DEG HW) Chiller CH-3												
	ELEC	29769	28492	33642	35825	41578	44948	49987	49537	41532	37184	30454	30582	453,528
	PK	47.6	54.3	62.7	68.6	75.3	86.7	94.0	92.0	81.6	68.9	57.6	52.0	94.0
2	EQ5100	COOLING TOWER FANS Twr. Fan CT-1B												
	ELEC	2717	2778	3432	4037	5322	6860	7975	7929	6760	4504	2884	2868	58,066
	PK	5.3	6.2	7.1	8.8	10.8	10.8	10.8	10.8	10.8	9.4	6.4	6.0	10.8
2	EQ5100	COOLING TOWER FANS												
	WATER	147	143	172	187	221	237	258	256	218	194	153	152	2,337
	PK	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.5
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10B												
	ELEC	13615	12298	13615	13176	13615	13176	13615	13615	13176	13615	13176	13615	160,308
	PK	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH1												
	ELEC	4836	4368	4836	4680	4836	4680	4836	4836	4680	4836	4680	4836	56,940
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-1												
	ELEC	893	806	893	864	893	864	893	893	864	893	864	893	10,512
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1												
	ELEC	186	168	186	180	186	180	186	186	180	186	180	186	2,190
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH2												
	ELEC	7589	6854	7589	7344	7589	7344	7589	7589	7344	7589	7344	7589	89,352
	PK	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1												
	ELEC	485	438	485	469	485	469	485	485	469	485	469	485	5,712
	PK	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH3												
	ELEC	4836	4368	4836	4680	4836	4680	4836	4836	4680	4836	4680	4836	56,940
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1												
	ELEC	309	279	309	299	309	299	309	309	299	309	299	309	3,635
	PK	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH5												
	ELEC	12871	11626	12871	12456	12871	12456	12871	12871	12456	12871	12456	12871	151,548
	PK	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1												
	ELEC	911	823	911	882	911	882	911	911	882	911	882	911	10,731
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH6												
	ELEC	10342	9341	10342	10008	10342	10008	10342	10342	10008	10342	10008	10342	121,764
	PK	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-2												
	ELEC	2009	1814	2009	1944	2009	1944	2009	2009	1944	2009	1944	2009	23,652
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Total													
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	136	123	136	131	136	131	136	136	131	136	131	136
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH7											
	ELEC	5506	4973	5506	5328	5506	5328	5506	5506	5328	5506	5328	5506
	PK	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	386	349	386	374	386	374	386	386	374	386	374	386
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-8											
	ELEC	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455
	PK	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-9											
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-10											
	ELEC	1339	1210	1339	1296	1339	1296	1339	1339	1296	1339	1296	1339
	PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-11A											
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
11	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-11B											
	ELEC	3497	3158	3497	3384	3497	3384	3497	3497	3384	3497	3384	3497
	PK	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
12	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-12											
	ELEC	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455
	PK	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
13	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-14											
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
13	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS1											
	ELEC	116	105	116	112	116	112	116	116	112	116	112	116
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
14	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS4												
	ELEC	16889	15254	16889	16344	16889	16344	16889	16889	16344	16889	16344	16889	198,852
	PK	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
1	EQ2002	GAS FIRED STEAM BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5061	CONDENSATE RETURN PUMP (HIGH EFFICIENCY)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5406	MAKE-UP WATER												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ2002	GAS FIRED STEAM BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 4  
EXISTING SECONDARY EQUIPMENT AND SYSTEMS

----- SYSTEM LOAD PROFILE -----

**ECO-C, LSTC BUILDING**

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	6.5	0	0	-79,960	77	6,718	10,171.0	0	0	0.0	0	0
5 - 10	12.9	0	0	-159,919	19	1,678	20,342.1	0	0	0.0	0	0
10 - 15	19.4	0	0	-239,879	4	316	30,513.2	0	0	0.0	0	0
15 - 20	25.9	0	0	-319,838	1	48	40,684.2	0	0	0.0	0	0
20 - 25	32.3	55	4,792	-399,798	0	0	50,855.3	0	0	0.0	0	0
25 - 30	38.8	1	47	-479,757	0	0	61,026.3	0	0	0.0	0	0
30 - 35	45.3	3	305	-559,717	0	0	71,197.4	0	0	0.0	0	0
35 - 40	51.8	0	35	-639,677	0	0	81,368.4	0	0	0.0	0	0
40 - 45	58.2	0	12	-719,636	0	0	91,539.5	0	0	0.0	0	0
45 - 50	64.7	1	61	-799,596	0	0	101,710.5	0	0	0.0	0	0
50 - 55	71.2	1	64	-879,555	0	0	111,881.6	54	4,771	0.0	0	0
55 - 60	77.6	2	133	-959,515	0	0	122,052.6	1	64	0.0	0	0
60 - 65	84.1	3	306	-1,039,475	0	0	132,223.7	2	175	0.0	0	0
65 - 70	90.6	3	293	-1,119,434	0	0	142,394.7	2	173	0.0	0	0
70 - 75	97.0	3	295	-1,199,394	0	0	152,565.8	1	90	0.0	0	0
75 - 80	103.5	5	447	-1,279,353	0	0	162,736.8	1	61	0.0	0	0
80 - 85	110.0	3	282	-1,359,313	0	0	172,907.9	0	38	0.0	0	0
85 - 90	116.5	4	361	-1,439,272	0	0	183,078.9	1	103	0.0	0	0
90 - 95	122.9	6	523	-1,519,232	0	0	193,250.0	0	0	0.0	0	0
95 - 100	129.4	9	804	-1,599,192	0	0	203,421.0	38	3,285	0.0	0	0
Hours Off	0.0	0	0	0	0	0	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
EXISTING PRIMARY EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
0	LIGHTS	Lighting Systems												
	ELEC	31826	28759	32604	30674	32215	31452	31437	32604	30674	32215	30674	31437	376,570
	PK	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8
1	MISC LD													
	ELEC	26931	24324	26931	26062	26931	26062	26931	26931	26062	26931	26062	26931	317,085
	PK	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	3452	3118	3452	3341	3452	3341	3452	3452	3341	3452	3341	3452	40,646
	PK	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
2		BASE UTILITY												
	HOTLD	576	520	576	557	576	557	576	576	557	576	557	576	6,780
	PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
1	EQ1010S	2-STG CTV<190 TONS W/HT REC(95 DEG HW) Chiller CH-1												
	ELEC	39290	37012	41568	40819	42332	41343	42697	42831	41029	42189	39846	40952	491,907
	PK	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-1A												
	ELEC	2074	2106	2442	2592	3689	5873	8577	8693	6878	3225	2264	2349	50,763
	PK	8.3	8.6	8.6	9.8	11.7	12.5	12.5	12.5	12.5	10.5	8.7	8.6	12.5

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	130	126	143	142	148	145	150	151	144	147	135	138	1,701
	PK	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-7												
	ELEC	29239	26410	29239	28296	29239	28296	29239	29239	28296	29239	28296	29239	344,268
	PK	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10A												
	ELEC	20460	18480	20460	19800	20460	19800	20460	20460	19800	20460	19800	20460	240,900
	PK	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-5												
	ELEC	5661	5113	5661	5478	5661	5478	5661	5661	5478	5661	5478	5661	66,649
	PK	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
2	EQ1010S	2-STG CTV<190 TONS W\HT REC(95 DEG HW) Chiller CH-3												
	ELEC	620	2622	4756	6180	8648	9406	9892	9999	8505	6867	3175	2541	73,212
	PK	22.5	23.5	27.9	32.3	34.5	37.0	39.3	39.1	36.9	33.1	27.9	23.6	39.3
2	EQ5100	COOLING TOWER FANS Twr. Fan CT-1B												
	ELEC	0	0	0	102	665	2578	2968	2880	1821	199	0	0	11,212
	PK	0.0	0.0	0.0	3.4	7.1	10.8	10.8	10.8	10.8	4.8	0.0	0.0	10.8
2	EQ5100	COOLING TOWER FANS												
	WATER	2	8	18	24	36	41	43	43	36	27	10	8	295
	PK	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10B												
	ELEC	933	2855	3861	5051	5435	5344	5472	5527	5325	5234	2855	2800	50,691
	PK	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	51	156	211	276	297	292	299	302	291	286	156	153	2,770
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH1											
	ELEC	1849	1744	1947	1882	1948	1890	1934	1954	1882	1942	1863	1927
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
1	EQ4223	FC FAN W/VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	1	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-1											
	ELEC	335	326	362	349	361	350	359	362	349	360	347	361
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH2											
	ELEC	2910	2821	3395	3335	3466	3355	3463	3467	3349	3461	3341	3444
	PK	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
2	EQ4223	FC FAN W/VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	182	172	175	95	61	1	1	1	59	101	209	214
	PK	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.6	0.6	0.6	0.6
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH3											
	ELEC	1814	1638	1814	1755	1814	1755	1814	1814	1755	1814	1755	1814
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
3	EQ4223	FC FAN W/VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	115	104	103	50	27	1	1	1	26	52	112	115
	PK	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.4	0.4	0.4	0.4
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH5											
	ELEC	4827	4360	4843	4714	4928	4812	4944	4976	4789	4928	4696	4828
	PK	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3	17.3
4	EQ4223	FC FAN W/VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	341	308	305	156	89	17	17	17	105	161	330	341
	PK	1.2	1.2	1.2	1.2	1.2	0.1	0.1	0.1	1.2	1.2	1.2	1.2
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH6											
	ELEC	3933	3670	4079	3952	4142	4077	4200	4225	4069	4178	3929	4063
	PK	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
5	EQ4223	FC FAN W/VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	4	70	102	53	72	2	2	2	70	50	47	6
	PK	0.2	0.8	0.8	0.8	0.8	0.3	0.3	0.3	0.8	0.8	0.8	0.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
EXISTING PRIMARY EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-2												
	ELEC	753	680	753	729	791	788	807	815	786	804	740	753	9,201
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH7												
	ELEC	2094	1865	2065	2116	2217	2294	2368	2405	2153	2190	1998	2065	25,830
	PK	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
6	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE Fan AHS1												
	ELEC	146	130	129	75	50	9	9	10	48	77	140	144	968
	PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-8												
	ELEC	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455	28,908
	PK	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-9												
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166	49,056
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-10												
	ELEC	1339	1210	1339	1296	1339	1296	1339	1339	1296	1339	1296	1339	15,768
	PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-11A												
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753	32,412
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
11	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-11B												
	ELEC	3497	3158	3497	3384	3497	3384	3497	3497	3384	3497	3384	3497	41,172
	PK	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
12	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-12												
	ELEC	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455	28,908
	PK	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
13	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-14												
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166	49,056
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
13	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE Fan AHS1												
	ELEC	116	104	116	112	116	112	116	116	112	116	112	116	1,362
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
EXISTING PRIMARY EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
14	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AHS4												
	ELEC	16889	15254	16889	16344	16889	16344	16889	16889	16344	16889	16344	16889	198,852
	PK	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
1	EQ2002	GAS FIRED STEAM BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5061	CONDENSATE RETURN PUMP (HIGH EFFICIENCY)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5406	MAKE-UP WATER												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ2002	GAS FIRED STEAM BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING SECONDARY EQUIPMENT AND SYSTEMS

----- SYSTEM LOAD PROFILE -----

**ECO-D, LSTC BUILDING**

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	5.9	0	0	-54,281	88	1,668	6,618.8	0	0	0.0	0	0
5 - 10	11.9	0	0	-108,562	12	221	13,237.7	0	0	0.0	0	0
10 - 15	17.8	54	4,740	-162,843	0	0	19,856.5	0	0	0.0	0	0
15 - 20	23.7	0	30	-217,124	0	0	26,475.3	0	0	0.0	0	0
20 - 25	29.7	3	250	-271,405	0	0	33,094.2	0	0	0.0	0	0
25 - 30	35.6	1	69	-325,686	0	0	39,713.0	0	0	0.0	0	0
30 - 35	41.5	1	46	-379,967	0	0	46,331.8	0	0	0.0	0	0
35 - 40	47.5	1	123	-434,248	0	0	52,950.7	0	0	0.0	0	0
40 - 45	53.4	4	343	-488,529	0	0	59,569.5	0	0	0.0	0	0
45 - 50	59.4	2	147	-542,810	0	0	66,188.3	54	4,745	0.0	0	0
50 - 55	65.3	2	175	-597,091	0	0	72,807.2	3	267	0.0	0	0
55 - 60	71.2	3	305	-651,373	0	0	79,426.0	1	99	0.0	0	0
60 - 65	77.2	2	177	-705,654	0	0	86,044.8	1	93	0.0	0	0
65 - 70	83.1	3	259	-759,935	0	0	92,663.7	0	18	0.0	0	0
70 - 75	89.0	4	348	-814,216	0	0	99,282.5	1	53	0.0	0	0
75 - 80	95.0	4	356	-868,497	0	0	105,901.3	1	46	0.0	0	0
80 - 85	100.9	2	200	-922,778	0	0	112,520.2	10	889	0.0	0	0
85 - 90	106.8	4	354	-977,059	0	0	119,139.0	3	271	0.0	0	0
90 - 95	112.8	10	838	-1,031,340	0	0	125,757.8	11	998	0.0	0	0
95 - 100	118.7	0	0	-1,085,621	0	0	132,376.7	15	1,281	0.0	0	0
Hours Off	0.0	0	0	0	0	6,871	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
Total													
0	LIGHTS	Lighting Systems											
	ELEC	31826	28759	32604	30674	32215	31452	31437	32604	30674	32215	30674	31437
	PK	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8
1	MISC LD												
	ELEC	26931	24324	26931	26062	26931	26062	26931	26931	26062	26931	26062	26931
	PK	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4
2	MISC LD												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD												
	OIL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD												
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD												
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD												
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	BASE UTILITY												
	CHILLD	3452	3118	3452	3341	3452	3341	3452	3452	3341	3452	3341	3452
	PK	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
2	BASE UTILITY												
	HOTLD	576	520	576	557	576	557	576	576	557	576	557	576
	PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
1	EQ1010S	2-STG CTV<190 TONS W/HT REC(95 DEG HW) Chiller CH-1											
	ELEC	29182	29595	34278	34049	36892	36951	38363	38476	35653	35366	31788	32142
	PK	84.7	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-1A											
	ELEC	1545	1825	2220	2372	3350	5375	8377	8552	6499	2753	1914	1945
	PK	8.5	8.7	8.9	9.9	11.8	12.5	12.5	12.5	12.5	10.6	8.8	8.7



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	99	104	123	123	134	135	140	141	130	128	112	112	1,481
	PK	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-7												
	ELEC	29239	26410	29239	28296	29239	28296	29239	29239	28296	29239	28296	29239	344,268
	PK	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3	39.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10A												
	ELEC	20460	18480	20460	19800	20460	19800	20460	20460	19800	20460	19800	20460	240,900
	PK	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-5												
	ELEC	5661	5113	5661	5478	5661	5478	5661	5661	5478	5661	5478	5661	66,649
	PK	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
2	EQ1010S	2-STG CTV<190 TONS W/HT REC(95 DEG HW) Chiller CH-3												
	ELEC	0	94	1717	3285	4934	5901	5783	6321	4669	3725	253	94	36,776
	PK	0.0	22.5	23.5	27.4	30.4	32.0	33.4	33.2	31.6	29.4	23.3	22.5	33.4
2	EQ5100	COOLING TOWER FANS Twr. Fan CT-1B												
	ELEC	0	0	0	0	256	1934	2246	2253	1001	15	0	0	7,704
	PK	0.0	0.0	0.0	1.8	6.3	10.8	10.8	10.8	10.8	3.7	0.0	0.0	10.8
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	5	10	17	20	20	22	16	12	1	0	124
	PK	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10B												
	ELEC	0	293	3129	3111	4026	4538	4429	4721	3678	3257	586	311	32,080
	PK	0.0	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3	18.3
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	16	171	170	220	248	242	258	201	178	32	17	1,753
	PK	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
		Fan AH1												
1	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	1810	1713	1902	1831	1898	1842	1900	1919	1845	1894	1831	1895	22,280
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
		Fan AHS1												
1	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	0	0	15	0	8	0	0	0	7	0	0	0	31
	PK	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.2
		Fan EF-1												
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	335	335	372	360	372	382	390	395	379	372	360	372	4,423
	PK	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
		Fan AH2												
2	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	2927	2908	3467	3355	3443	3331	3437	3419	3292	3405	3323	3425	39,733
	PK	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2
		Fan AHS1												
2	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	187	195	182	100	63	4	4	4	61	103	213	219	1,336
	PK	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.6	0.6	0.6	0.6	0.6
		Fan AH3												
3	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	1262	1186	1387	1223	1325	1322	1169	1387	1223	1269	1173	1281	15,207
	PK	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
		Fan AHS1												
3	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	81	94	98	52	37	5	6	6	35	53	90	92	650
	PK	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.4	0.4	0.4	0.4	0.4
		Fan AHS5												
4	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	566	1148	1554	1730	2681	3468	3301	3642	2708	2152	1189	1179	25,319
	PK	5.0	10.1	10.1	14.1	17.2	17.2	17.2	17.2	17.2	14.1	10.1	10.1	17.2
		Fan AHS1												
4	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	40	81	158	74	74	14	14	15	75	87	84	83	802
	PK	0.4	0.7	1.2	1.2	1.2	0.0	0.0	0.0	1.2	1.2	0.7	0.7	1.2
		Fan AH6												
5	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	2646	2813	3334	3148	3471	3523	3451	3671	3287	3310	2873	3013	38,539
	PK	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
		Fan AHS1												
5	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	0	87	96	48	65	0	0	0	63	49	47	0	455
	PK	0.0	0.8	0.8	0.8	0.8	0.1	0.2	0.0	0.8	0.8	0.8	0.8	0.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
5	EQ4003	Fan EF-2												
		FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	753	739	826	830	878	858	878	888	848	869	840	823	10,031
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
6	EQ4223	Fan AH7												
		FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	2087	1859	2058	2110	2220	2287	2360	2397	2147	2183	1992	2058	25,759
	PK	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
6	EQ4223	Fan AHS1												
		FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	146	130	130	77	53	14	14	14	51	80	140	144	993
	PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5
7	EQ4003	Fan AH-8												
		FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455	28,908
	PK	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
8	EQ4003	Fan AH-9												
		FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166	49,056
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
9	EQ4003	Fan AH-10												
		FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	1339	1210	1339	1296	1339	1296	1339	1339	1296	1339	1296	1339	15,768
	PK	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
10	EQ4003	Fan AH-11A												
		FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753	32,412
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
11	EQ4003	Fan AH-11B												
		FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	3497	3158	3497	3384	3497	3384	3497	3497	3384	3497	3384	3497	41,172
	PK	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
12	EQ4003	Fan AH-12												
		FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	2455	2218	2455	2376	2455	2376	2455	2455	2376	2455	2376	2455	28,908
	PK	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
13	EQ4003	Fan AH-14												
		FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	4166	3763	4166	4032	4166	4032	4166	4166	4032	4166	4032	4166	49,056
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
13	EQ4223	Fan AHS1												
		FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	116	104	116	112	116	112	116	116	112	116	112	116	1,362
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

EQUIPMENT ENERGY CONSUMPTION														
Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
14	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE Fan AHS4												
	ELEC	1533	1385	1533	1484	1533	1484	1533	1533	1484	1533	1484	1533	18,054
	PK	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9
1	EQ2002	GAS FIRED STEAM BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5061	CONDENSATE RETURN PUMP (HIGH EFFICIENCY)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5406	MAKE-UP WATER												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ2002	GAS FIRED STEAM BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- E Q U I P M E N T   E N E R G Y   C O N S U M P T I O N -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
2	EQ5061	CONDENSATE RETURN PUMP (HIGH EFFICIENCY)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5406	MAKE-UP WATER												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING SECONDARY EQUIPMENT AND SYSTEMS

----- SYSTEM LOAD PROFILE -----

**ECO-E, LSTC BUILDING**

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	5.9	0	0	-54,281	88	1,668	6,618.8	0	0	0.0	0	0
5 - 10	11.9	0	0	-108,562	12	221	13,237.7	0	0	0.0	0	0
10 - 15	17.8	54	4,740	-162,843	0	0	19,856.5	0	0	0.0	0	0
15 - 20	23.7	0	30	-217,124	0	0	26,475.3	0	0	0.0	0	0
20 - 25	29.7	3	250	-271,405	0	0	33,094.2	0	0	0.0	0	0
25 - 30	35.6	1	69	-325,686	0	0	39,713.0	0	0	0.0	0	0
30 - 35	41.5	1	46	-379,967	0	0	46,331.8	0	0	0.0	0	0
35 - 40	47.5	1	123	-434,248	0	0	52,950.7	0	0	0.0	0	0
40 - 45	53.4	4	343	-488,529	0	0	59,569.5	0	0	0.0	0	0
45 - 50	59.4	2	147	-542,810	0	0	66,188.3	54	4,745	0.0	0	0
50 - 55	65.3	2	175	-597,091	0	0	72,807.2	3	267	0.0	0	0
55 - 60	71.2	3	305	-651,373	0	0	79,426.0	1	99	0.0	0	0
60 - 65	77.2	2	177	-705,654	0	0	86,044.8	1	93	0.0	0	0
65 - 70	83.1	3	259	-759,935	0	0	92,663.7	0	18	0.0	0	0
70 - 75	89.0	4	348	-814,216	0	0	99,282.5	1	53	0.0	0	0
75 - 80	95.0	4	356	-868,497	0	0	105,901.3	1	46	0.0	0	0
80 - 85	100.9	2	200	-922,778	0	0	112,520.2	10	889	0.0	0	0
85 - 90	106.8	4	354	-977,059	0	0	119,139.0	3	271	0.0	0	0
90 - 95	112.8	10	838	-1,031,340	0	0	125,757.8	11	998	0.0	0	0
95 - 100	118.7	0	0	-1,085,621	0	0	132,376.7	15	1,281	0.0	0	0
Hours Off	0.0	0	0	0	0	6,871	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO E MOTOR REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total	
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec		
0	LIGHTS	Lighting Systems													
	ELEC	31826	28759	32604	30674	32215	31452	31437	32604	30674	32215	30674	31437	376,570	
	PK	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	
1	MISC LD														
	ELEC	26931	24324	26931	26062	26931	26062	26931	26931	26062	26931	26062	26931	317,085	
	PK	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	
2	MISC LD														
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	MISC LD														
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	MISC LD														
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	MISC LD														
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	MISC LD														
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1		BASE UTILITY													
	CHILLD	3452	3118	3452	3341	3452	3341	3452	3452	3341	3452	3341	3452	40,646	
	PK	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	
2		BASE UTILITY													
	HOTLD	576	520	576	557	576	557	576	576	557	576	557	576	6,780	
	PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
1	EQ1010S	2-STG CTV<190 TONS W\HT REC(95 DEG HW) Chiller CH-1													
	ELEC	29182	29595	34278	34049	36892	36951	38363	38476	35653	35366	31788	32142	412,735	
	PK	84.7	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	88.1	
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-1A													
	ELEC	1483	1752	2131	2277	3216	5160	8042	8210	6239	2643	1837	1867	44,857	
	PK	8.1	8.4	8.5	9.5	11.3	12.0	12.0	12.0	12.0	10.2	8.5	8.4	12.0	

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO E MOTOR REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	99	104	123	123	134	135	140	141	130	128	112	112	1,481
	PK	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-7												
	ELEC	28942	26141	28942	28008	28942	28008	28942	28942	28008	28942	28008	28942	340,764
	PK	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10A												
	ELEC	18451	16666	18451	17856	18451	17856	18451	18451	17856	18451	17856	18451	217,248
	PK	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8	24.8
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-5												
	ELEC	5354	4836	5354	5181	5354	5181	5354	5354	5181	5354	5181	5354	63,035
	PK	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
2	EQ1010S	2-STG CTV<190 TONS W/HT REC(95 DEG HW) Chiller CH-3												
	ELEC	0	94	1717	3285	4934	5901	5783	6321	4669	3725	253	94	36,776
	PK	0.0	22.5	23.5	27.4	30.4	32.0	33.4	33.2	31.6	29.4	23.3	22.5	33.4
2	EQ5100	COOLING TOWER FANS Twr. Fan CT-1B												
	ELEC	0	0	0	0	246	1863	2163	2169	963	15	0	0	7,419
	PK	0.0	0.0	0.0	1.7	6.1	10.4	10.4	10.4	10.4	3.6	0.0	0.0	10.4
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	5	10	17	20	20	22	16	12	1	0	124
	PK	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump 10B												
	ELEC	0	283	3027	3009	3894	4390	4283	4567	3558	3151	566	301	31,028
	PK	0.0	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7	17.7
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	16	171	170	220	248	242	258	201	178	32	17	1,753
	PK	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO E MOTOR REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AH1											
	ELEC	1671	1581	1755	1691	1752	1709	1754	1772	1703	1748	1690	1749
	PK	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	0	0	15	0	8	0	0	0	7	0	0	0
	PK	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.0	0.0
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-1											
	ELEC	307	307	341	330	341	350	358	362	348	341	330	341
	PK	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
2	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AH2											
	ELEC	2784	2766	3297	3191	3274	3168	3268	3251	3131	3238	3161	3257
	PK	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
2	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	187	195	182	100	63	4	4	4	61	103	213	219
	PK	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.6	0.6	0.6	0.6
3	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AH3											
	ELEC	1165	1095	1280	1129	1223	1221	1079	1280	1129	1171	1083	1182
	PK	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
3	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	81	94	98	52	37	5	6	6	35	53	90	92
	PK	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.4	0.4	0.4	0.4
4	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS											
	ELEC	543	1102	1491	1660	2572	3327	3167	3494	2598	2065	1141	1131
	PK	4.8	9.7	9.7	13.5	16.5	16.5	16.5	16.5	16.5	13.5	9.7	9.7
4	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	40	81	158	74	74	14	14	15	75	87	84	83
	PK	0.4	0.7	1.2	1.2	1.2	0.0	0.0	0.0	1.2	1.2	0.7	0.7
5	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AH6											
	ELEC	2532	2691	3190	3012	3321	3371	3302	3512	3145	3167	2749	2883
	PK	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
5	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	0	87	96	48	65	0	0	0	63	49	47	0
	PK	0.0	0.8	0.8	0.8	0.8	0.1	0.2	0.0	0.8	0.8	0.8	0.8

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
ECO E MOTOR REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
5	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-2													8,916 2.4
	ELEC	670	657	734	738	780	763	780	790	753	773	747	732	
	PK	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	
6	FC FAN W/VARIABLE SPEED DRIVE Fan AH7													25,062 7.2
	ELEC	2031	1809	2002	2053	2160	2225	2297	2333	2088	2124	1938	2002	
	PK	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	
6	FC FAN W/VARIABLE SPEED DRIVE Fan AHS1													993 0.5
	ELEC	146	130	130	77	53	14	14	14	51	80	140	144	
	PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	
7	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-8													27,156 3.1
	ELEC	2306	2083	2306	2232	2306	2232	2306	2306	2232	2306	2232	2306	
	PK	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	
8	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-9													43,800 5.0
	ELEC	3720	3360	3720	3600	3720	3600	3720	3720	3600	3720	3600	3720	
	PK	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
9	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-10													14,892 1.7
	ELEC	1265	1142	1265	1224	1265	1224	1265	1265	1224	1265	1224	1265	
	PK	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	
10	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-11A													30,660 3.5
	ELEC	2604	2352	2604	2520	2604	2520	2604	2604	2520	2604	2520	2604	
	PK	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	
11	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-11B													38,544 4.4
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274	
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
12	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-12													27,156 3.1
	ELEC	2306	2083	2306	2232	2306	2232	2306	2306	2232	2306	2232	2306	
	PK	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	
13	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-14													43,800 5.0
	ELEC	3720	3360	3720	3600	3720	3600	3720	3720	3600	3720	3600	3720	
	PK	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
13	FC FAN W/VARIABLE SPEED DRIVE Fan AHS1													1,362 0.2
	ELEC	116	104	116	112	116	112	116	116	112	116	112	116	
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2

ECO E MOTOR REPLMNT

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
14	EQ4223	FC FAN W/VARIABLE SPEED DRIVE Fan AHS4												
	ELEC	1506	1361	1506	1458	1506	1458	1506	1506	1458	1506	1458	1506	17,736
	PK	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5
1	EQ2002	GAS FIRED STEAM BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5061	CONDENSATE RETURN PUMP (HIGH EFFICIENCY)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ5406	MAKE-UP WATER												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ2002	GAS FIRED STEAM BOILER												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5240	BOILER FORCED DRAFT FAN												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING SECONDARY EQUIPMENT AND SYSTEMS

----- SYSTEM LOAD PROFILE -----

ECO-F, LSTC BUILDING

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	5.9	0	0	-54,281	88	1,668	6,618.8	0	0	0.0	0	0
5 - 10	11.9	0	0	-108,562	12	221	13,237.7	0	0	0.0	0	0
10 - 15	17.8	54	4,740	-162,843	0	0	19,856.5	0	0	0.0	0	0
15 - 20	23.7	0	30	-217,124	0	0	26,475.3	0	0	0.0	0	0
20 - 25	29.7	3	250	-271,405	0	0	33,094.2	0	0	0.0	0	0
25 - 30	35.6	1	69	-325,686	0	0	39,713.0	0	0	0.0	0	0
30 - 35	41.5	1	46	-379,967	0	0	46,331.8	0	0	0.0	0	0
35 - 40	47.5	1	123	-434,248	0	0	52,950.7	0	0	0.0	0	0
40 - 45	53.4	4	343	-488,529	0	0	59,569.5	0	0	0.0	0	0
45 - 50	59.4	2	147	-542,810	0	0	66,188.3	54	4,745	0.0	0	0
50 - 55	65.3	2	175	-597,091	0	0	72,807.2	3	267	0.0	0	0
55 - 60	71.2	3	305	-651,373	0	0	79,426.0	1	99	0.0	0	0
60 - 65	77.2	2	177	-705,654	0	0	86,044.8	1	93	0.0	0	0
65 - 70	83.1	3	259	-759,935	0	0	92,663.7	0	18	0.0	0	0
70 - 75	89.0	4	348	-814,216	0	0	99,282.5	1	53	0.0	0	0
75 - 80	95.0	4	356	-868,497	0	0	105,901.3	1	46	0.0	0	0
80 - 85	100.9	2	200	-922,778	0	0	112,520.2	10	889	0.0	0	0
85 - 90	106.8	4	354	-977,059	0	0	119,139.0	3	271	0.0	0	0
90 - 95	112.8	10	838	-1,031,340	0	0	125,757.8	11	998	0.0	0	0
95 - 100	118.7	0	0	-1,085,621	0	0	132,376.7	15	1,281	0.0	0	0
Hours Off	0.0	0	0	0	0	6,871	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO F CHILLER REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Lighting Systems														
0	LIGHTS													
	ELEC	31826	28759	32604	30674	32215	31452	31437	32604	30674	32215	30674	31437	376,570
	PK	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8	94.8
1	MISC LD													
	ELEC	26931	24324	26931	26062	26931	26062	26931	26931	26062	26931	26062	26931	317,085
	PK	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4	72.4
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	BASE UTILITY													
	CHILLD	3452	3118	3452	3341	3452	3341	3452	3452	3341	3452	3341	3452	40,646
	PK	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
2	BASE UTILITY													
	HOTLD	576	520	576	557	576	557	576	576	557	576	557	576	6,780
	PK	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
1	YORK W.C. RECIP. CHILL. New Chiller CH-1													
	ELEC	12288	10170	9846	8097	7651	6732	6922	6766	7549	8552	11462	11513	107,546
	PK	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-1A												
	ELEC	3509	2862	2732	2417	2771	3435	4804	4797	4312	2886	3131	3210	40,866
	PK	11.5	11.6	11.5	11.6	12.0	12.0	12.0	12.0	12.0	11.5	11.5	11.6	12.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO F CHILLER REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ5100	COOLING TOWER FANS												
	WATER	61	51	50	41	39	35	36	35	39	43	57	57	544
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	1857	1550	1634	1483	1431	1324	1370	1353	1386	1528	1699	1744	18,359
	PK	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
		New CHW Pump P-7A												
1	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	3208	2678	2823	2561	2472	2288	2366	2338	2394	2639	2935	3013	31,717
	PK	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
		New CND Pump 10A												
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	575	480	506	459	443	410	424	419	429	473	526	540	5,684
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		New Chiller CH-3												
2		YORK CENT. R-123 CHILLER												
	ELEC	8289	9991	13385	15089	17630	19163	20172	20589	17147	15638	10301	10524	177,919
	PK	53.2	56.1	61.9	65.4	68.9	73.5	76.1	75.8	72.8	67.2	61.7	57.6	76.1
2	EQ5100	COOLING TOWER FANS												
	ELEC	916	1149	1537	1786	2326	3134	3319	3365	2710	1926	1179	1212	24,557
	PK	6.4	6.9	7.3	8.8	10.4	10.4	10.4	10.4	10.4	9.4	7.6	6.9	10.4
		Twr. Fan CT-1B												
2	EQ5100	COOLING TOWER FANS												
	WATER	49	61	83	94	113	120	124	127	108	98	63	64	1,105
	PK	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	1618	1823	2337	2581	2814	2898	2992	3039	2721	2627	1851	1935	29,237
	PK	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4	9.4
		New CHW Pump P-7B												
2	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	2111	2379	3050	3367	3672	3782	3904	3965	3550	3428	2416	2525	38,149
	PK	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2
		New CND Pump 10B												
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	173	195	250	276	301	310	320	325	291	281	198	207	3,127
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ4223	FC FAN W/VARIABLE SPEED DRIVE												
	ELEC	1671	1581	1755	1691	1752	1700	1754	1772	1703	1748	1690	1749	20,567
	PK	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
		Fan AH1												

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO F CHILLER REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	0	0	15	0	8	0	0	0	7	0	0	0
	PK	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.0	0.0
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-1											
	ELEC	307	307	341	330	341	350	358	362	348	341	330	341
	PK	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
2	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AH2											
	ELEC	2784	2766	3297	3191	3274	3168	3268	3251	3131	3238	3161	3257
	PK	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7	9.7
2	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	187	195	182	100	63	4	4	4	61	103	213	219
	PK	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.6	0.6	0.6	0.6
3	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AH3											
	ELEC	1165	1095	1280	1129	1223	1221	1079	1280	1129	1171	1083	1182
	PK	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
3	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	81	94	98	52	37	5	6	6	35	53	90	92
	PK	0.4	0.4	0.4	0.4	0.4	0.0	0.0	0.0	0.4	0.4	0.4	0.4
4	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS5											
	ELEC	543	1102	1491	1660	2572	3327	3167	3494	2598	2065	1141	1131
	PK	4.8	9.7	9.7	13.5	16.5	16.5	16.5	16.5	16.5	13.5	9.7	9.7
4	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	40	81	158	74	74	14	14	15	75	87	84	83
	PK	0.4	0.7	1.2	1.2	1.2	0.0	0.0	0.0	1.2	1.2	0.7	0.7
5	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AH6											
	ELEC	2532	2691	3190	3012	3321	3371	3302	3512	3145	3167	2749	2883
	PK	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3
5	EQ4223	FC FAN W\VARIABLE SPEED DRIVE Fan AHS1											
	ELEC	0	87	96	48	65	0	0	0	63	49	47	0
	PK	0.0	0.8	0.8	0.8	0.8	0.1	0.2	0.0	0.8	0.8	0.8	0.8
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan EF-2											
	ELEC	670	657	734	738	780	763	780	790	753	773	747	732
	PK	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO F CHILLER REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Fan AH7														
6	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	2031	1809	2002	2053	2160	2225	2297	2333	2088	2124	1938	2002	25,062
	PK	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2
Fan AHS1														
6	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	146	130	130	77	53	14	14	14	51	80	140	144	993
	PK	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5
Fan AH-8														
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	2306	2083	2306	2232	2306	2232	2306	2306	2232	2306	2232	2306	27,156
	PK	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Fan AH-9														
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	3720	3360	3720	3600	3720	3600	3720	3720	3600	3720	3600	3720	43,800
	PK	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Fan AH-10														
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	1265	1142	1265	1224	1265	1224	1265	1265	1224	1265	1224	1265	14,892
	PK	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Fan AH-11A														
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	2604	2352	2604	2520	2604	2520	2604	2604	2520	2604	2520	2604	30,660
	PK	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
Fan AH-11B														
11	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274	38,544
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Fan AH-12														
12	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	2306	2083	2306	2232	2306	2232	2306	2306	2232	2306	2232	2306	27,156
	PK	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Fan AH-14														
13	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME												
	ELEC	3720	3360	3720	3600	3720	3600	3720	3720	3600	3720	3600	3720	43,800
	PK	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Fan AHS1														
13	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	116	104	116	112	116	112	116	116	112	116	112	116	1,362
	PK	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Fan AHS4														
14	EQ4223	FC FAN W\ VARIABLE SPEED DRIVE												
	ELEC	1506	1361	1506	1458	1506	1458	1506	1506	1458	1506	1458	1506	17,736
	PK	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
ECO F CHILLER REPLMNT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	OILBLR	OIL FIRED HOT WATER BOILER New HW Boiler B-1												9,058 2.1
	OIL	873	742	766	707	729	704	731	727	706	729	795	848	
	PK	2.1	2.1	1.6	1.2	1.1	1.1	1.1	1.1	1.1	1.1	2.1	2.1	
1	EQ5020	HEATING WATER CIRCULATION PUMP New HW pump P-5												4,468 0.5
	ELEC	379	343	379	367	379	367	379	379	367	379	367	379	
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
1	EQ5307	CONTROLS												4,380 0.5
	ELEC	372	336	372	360	372	360	372	372	360	372	360	372	
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
2	EQ2263	ELECTRIC RESISTANCE HEAT WITH FAN												0 0.0
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

## 01 Card - Job Information

Project: EEAP ENERGY STUDY - HELSTF  
 Location: WHITE SANDS - ALAMOGORDO, NEW MEXICO  
 Client: FORT WORTH CORPS OF ENGINEERS  
 Program User: HUITT-ZOLLARS, INC.  
 Comments: TEST CELL # 1 AND TEST CELL # 2

## EXISTING TEST CELLS 1 &amp; 2

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect
HOLLOMAN								

## ----- Load Section Alternative #1 -----

## Card 19- Load Alternative -

Number	Description
1	EXISTING CONDITIONS

## Card 20----- General Room Parameters -----

Zone							Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Room	Reference	Room	Floor	Floor	Const	Plenum	Ceiling	Floor	Floors	Rooms per	Depth
Number	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Multiplier	Zone	
5	1	DEVICE RM. A-104	69	33	8	0	1	32			
10	2	DEVICE RM B-105	32	41	8	0	1	29			
15	3	RM 102, 103	59	36	8	0	1	32			
20	4	RM 109	26	44	8	0	1	16			
25	5	PT ELEC RM 201	27	37	8	0	1	17			
30	6	RM. 101,102,105	46	46	8	0	1	15			
35	7	RM 102	24	30	8	0	1	15			
40	8	RM 204,301,401	57	57	8	0	1	15			
45	9	HPOC, 501	25	24	8	0	1	15			
50	10	ETA CNTRL RM 103	25.5	13	8	0	1	15			

## Card 21----- Thermostat Parameters -----

Cooling		Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
5	70	50	70		70	70				NO

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor
10	70	50	70		70	70				NO
15	70	50	70		70	70				NO
20	70	50	70		70	70				NO
25	70	50	70		70	70				NO
30	70	50	70		70	70				NO
35	70	50	70		70	70				NO
40	70	50	70		70	70				NO
45	70	50	70		70	70				NO
50	70	50	70		70	70				NO

## Card 22----- Roof Parameters -----

Room	Roof	Equal to	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	YES			0.1	23			
10	1	YES			0.1	23			
15	1		69	36	0.1	23			
25	1	YES			0.1	23			
30	1	YES			0.1	23			
45	1	YES			0.32	23			
50	1	YES			0.32	23			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Reflectance Multiplier
5	1	33	32	0.32	58	315			
5	2	69	32	0.32	58	45			
10	1	32	29	0.32	58	315			
10	2	29.5	29.5	0.32	58	225			
15	1	38	32	0.32	58	315			
15	2	38	32	0.32	58	135			
20	1	27	16	0.32	58	135			
25	1	27	17	0.32	58	135			
30	1	78	15	0.32	58	315			
30	2	43	15	0.32	58	45			
30	3	42	15	0.32	58	135			
30	4	30	15	0.32	58	225			
40	1	75	15	0.32	58	315			
40	2	75	15	0.32	58	45			
40	3	75	15	0.32	58	135			
40	4	75	15	0.32	58	225			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
45	1	25	15	0.32	58	315			
45	2	24	15	0.32	58	45			
45	3	25	15	0.32	58	135			
45	4	24	15	0.32	58	225			
50	1	13	15	0.32	58	45			
50	2	25.5	15	0.32	58	135			
50	3	8	15	0.32	58	225			

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	OFFICEP1	CLGONLY								
10	OFFICEP1	CLGONLY								
15	OFFICEP1	CLGONLY								
20	OFFICEP1	CLGONLY								
25	OFFICEP1	CLGONLY								
30	OFFICEP1	CLGONLY								
35	OFFICEP1	CLGONLY								
40	OFFICEP1	CLGONLY								
45	OFFICEP1	CLGONLY								
50	OFFICEP1	CLGONLY								

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---	
							Fixture Type			Reference Point 1	Reference Point 2
5	2	PEOPLE	250	200	17058	WATTS	INCAND				
10	2	PEOPLE	250	200	8098	WATTS	INCAND				
15	4	PEOPLE	250	200	5768	WATTS	INCAND				
20	2	PEOPLE	250	200	3693	WATTS	INCAND				
25	5	PEOPLE	250	200	2200	WATTS	INCAND				
30	3	PEOPLE	250	200	7892	WATTS	INCAND				
35	5	PEOPLE	250	200	690	WATTS	INCAND				
40	10	PEOPLE	250	200	4912	WATTS	ASHRAE1				
45	4	PEOPLE	250	200	2608	WATTS	INCAND				
50	1	PEOPLE	250	200	864	WATTS	ASHRAE1				

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment		Energy Consump Value	Energy Consump Units	Schedule Code	Equipment		Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
	Equipment Number	Descrip				Meter Code						
5	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC						

Card 28----- Miscellaneous Equipment -----										
Room	Misc	Equipment	Energy	Energy	Energy	Percent	Percent	Percent		
Number	Equipment	Equipment	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant
	Number	Descrip	Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction
10	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				
15	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				
20	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				
25	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				
30	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				
35	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				
40	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				
45	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				
50	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC				

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	280	CFM	280	CFM						
10	100	CFM	100	CFM						
15	4700	CFM	4700	CFM						
20	0	CFM	0	CFM						
25	0	CFM	0	CFM						
30	285	CFM	285	CFM						
35	790	CFM	790	CFM						
40	750	CFM	750	CFM						
45	3600	CFM	3600	CFM						
50	360	CFM	360	CFM						

Card 30----- Fan Airflows -----										
-----Main-----					-----Auxiliary-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Room Exhaust--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	5892	CFM	5892	CFM						
10	3344	CFM	3344	CFM						
15	10758	CFM	10758	CFM					600	CFM
20	15667	CFM	15667	CFM						
25	10386	CFM	10386	CFM						
30	2850	CFM	2850	CFM						
35	4080	CFM	4080	CFM						
40	12510	CFM	12510	CFM						
45	3600	CFM	3600	CFM						
50	1880	CFM	1880	CFM						

## ----- System Section Alternative #1 -----

## Card 39- System Alternative

Number	Description
1	EXISTING AIRSIDE EQUIPMENT

## Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System	Ventil	Fan					
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
1	TRH						
2	TRH						
3	TRH						
4	VTCV						
5	VTCV						
6	VTCV						
7	VTCV						
8	VTCV						
9	VTCV						
10	VTCV						

## Card 41----- Zone Assignment -----

System	Zone Assignment											
Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1										
2	2	2										
3	3	3										
4	4	4										
5	5	5										
6	6	6										
7	7	7										
8	8	8										
9	9	9										
10	10	10										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.5										
2	1.6										
3	1.9					.5					
4	1.6										
5	1.6										
6	4.6										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
7	2.0										
8	2.0										
9	1.5										
10	2.0										

## Card 43----- Airflow Design Temperatures -----

System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff
1	48.4	48.4								
2	48.4	48.4								
3	47.4	47.4								

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1						OFF				
2						OFF				
3						OFF				
4						OFF				
5						OFF				

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1	AVAIL								
2	AVAIL								
3	AVAIL								

## ----- Equipment Section Alternative #1 -----

## Card 59----- Equipment Description / TOD Schedules -----

	Elec Consump	Elec Demand	Demand		---- Demand Limit ---
Alternative	Time of Day	Time of Day	Limit		Temperature
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule Drift
1				EXISTING PRIMARY EQUIPMENT	

Card 60----- Cooling Load Assignment-----

Load		All Coil Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1		1	10								

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref	Code	Of	--Capacity--	Units	Value	Units	Value	Units	Value	Units	Order	Seq	Limit
1	EQ1001S	1	151	TONS	141	KW					1	PAR	
2	EQ1001S	1	151	TONS	141	KW					2	PAR	

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---		---CONDENSER---		---HT REC or AUX---		Switch-				
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.	
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.	
1	27.3	KW	13.2	KW					1	1	
2	28.7	KW	10.5	KW					2	2	

Card 65----- Heating Load Assignment -----

Load		All Coil									
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1	3	6	10						

Card 67----- Heating Equipment Parameters -----

Heat Equip	Number	HW Pmp	Energy		Seq	Switch	Demand					
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	over	Hot	Misc.	Limit		
Number	Name	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BLR51	1	2.7	KW	1060	MBH	1683	MBH	1		3	
2	BLR51	1	2.7	KW	1060	MBH	1683	MBH	2		4	

Card 69----- Fan Equipment Parameters -----

System	Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation	
1	EQ4003							
2	EQ4003							
3	EQ4003							
4	EQ4003							



## Card 69----- Fan Equipment Parameters -----

## System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
5	EQ4003						
6	EQ4003						
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						

## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY---				
System	Cool	Heat	Ret	Exh	Aux	Room	Opt				Room	Opt
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	4.9											
2	1.7											
3	8.6											
4	4.4											
5	4.1											
6	4.9											
7	8.7											
8	10.3											
9	2.1											
10	4.1											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW LOADS	45.6	TONS	AVAIL	CHILL-LD	1			
2	HW LOADS	90.9	MBH	AVAIL	HOT-LD	1			
3	ALL OTHER LIGHTS	8.79	KW	OFICEL24	ELEC				
4	ESH-53	22.4	KW	ESH53	ELEC				

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value
										Units
1	EQ5100			5.3	KW	T-WATER	CTOWER	1		
2	EQ5100			5.3	KW	T-WATER	CTOWER	1		

## Card 75----- Miscellaneous Accessory -----

#1					#2				#3			
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
1	EQ5013	22.3	KW									
2	EQ5013	22.3	KW									
3	EQ5020	6.4	KW									
4	EQ5020	7.2	KW									

## ----- Load Section Alternative #2 -----

**ECO-A, TEST CELLS 1 & 2**

## Card 19- Load Alternative -

Number	Description
2	ECO A - LIGHT FIXTURE UPGRADE

## Card 20----- General Room Parameters -----

Zone							Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Room	Reference	Room	Floor	Floor	Const	Plenum	Ceiling	Floor	Floors	Rooms per	Depth
Number	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Multiplier	Zone	
5	1	DEVICE RM. A-104	69	33	8	0	1	32			
10	2	DEVICE RM B-105	32	41	8	0	1	29			
15	3	RM 102, 103	59	36	8	0	1	32			
20	4	RM 109	26	44	8	0	1	16			
25	5	PT ELEC RM 201	27	37	8	0	1	17			
30	6	RM. 101,102,105	46	46	8	0	1	15			
35	7	RM 102	24	30	8	0	1	15			
40	8	RM 204,301,401	57	57	8	0	1	15			
45	9	HPOC, 501	25	24	8	0	1	15			
50	10	ETA CNTRL RM 103	25.5	13	8	0	1	15			

## Card 21----- Thermostat Parameters -----

Cooling		Room		Cooling		Heating		Heating		Heating		T'stat		Mass /		Carpet	
Room	Room	Design	Design	T'stat	T'stat	Room	Room	T'stat	T'stat	T'stat	T'stat	Location	Location	No. Hrs	No. Hrs	On	On
Number	Design DB	RH	Driftpoint	Schedule	Schedule	Design DB	Design DB	Driftpoint	Driftpoint	Schedule	Schedule	Flag	Flag	Average	Average	Floor	Floor
5	70	50	70			70	70									NO	NO
10	70	50	70			70	70									NO	NO
15	70	50	70			70	70									NO	NO
20	70	50	70			70	70									NO	NO
25	70	50	70			70	70									NO	NO
30	70	50	70			70	70									NO	NO
35	70	50	70			70	70									NO	NO
40	70	50	70			70	70									NO	NO
45	70	50	70			70	70									NO	NO
50	70	50	70			70	70									NO	NO

## Card 22----- Roof Parameters -----

Roof									
Room Number	Roof Number	Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
5	1	YES			0.1	23			
10	1	YES			0.1	23			
15	1		69	36	0.1	23			
25	1	YES			0.1	23			
30	1	YES			0.1	23			
45	1	YES			0.32	23			
50	1	YES			0.32	23			

## Card 24----- Wall Parameters -----

Wall									
Ground									
Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall Constuc Type	Wall Direction	Wall Tilt	Wall Alpha	Reflectance Multiplier
5	1	33	32	0.32	58	315			
5	2	69	32	0.32	58	45			
10	1	32	29	0.32	58	315			
10	2	29.5	29.5	0.32	58	225			
15	1	38	32	0.32	58	315			
15	2	38	32	0.32	58	135			
20	1	27	16	0.32	58	135			
25	1	27	17	0.32	58	135			
30	1	78	15	0.32	58	315			
30	2	43	15	0.32	58	45			
30	3	42	15	0.32	58	135			
30	4	30	15	0.32	58	225			
40	1	75	15	0.32	58	315			
40	2	75	15	0.32	58	45			
40	3	75	15	0.32	58	135			
40	4	75	15	0.32	58	225			
45	1	25	15	0.32	58	315			
45	2	24	15	0.32	58	45			
45	3	25	15	0.32	58	135			
45	4	24	15	0.32	58	225			
50	1	13	15	0.32	58	45			
50	2	25.5	15	0.32	58	135			
50	3	8	15	0.32	58	225			

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	OFFICEP1	CLGONLY								
10	OFFICEP1	CLGONLY								
15	OFFICEP1	CLGONLY								
20	OFFICEP1	CLGONLY								
25	OFFICEP1	CLGONLY								
30	OFFICEP1	CLGONLY								
35	OFFICEP1	CLGONLY								

Card 26----- Schedules -----

Room	Reheat	Cooling	Heating	Auxiliary	Room	Daylighting				
Number	People	Lights	Ventilation	Infiltration	Minimum	Fans	Fan	Fan	Exhaust	Controls
40	OFFICEP1	CLGONLY								
45	OFFICEP1	CLGONLY								
50	OFFICEP1	CLGONLY								

Card 27----- People and Lights -----

Room	People	People	People	People	Lighting	Lighting	Lighting	Ballast	Percent	--- Daylighting ---	
Number	Value	Units	Sensible	Latent	Value	Units	Type	Factor	Ret. Air	Reference Point 1	Reference Point 2
5	2	PEOPLE	250	200	15118	WATTS	INCAND				
10	2	PEOPLE	250	200	7454	WATTS	INCAND				
15	4	PEOPLE	250	200	5084	WATTS	INCAND				
20	2	PEOPLE	250	200	2148	WATTS	INCAND				
25	5	PEOPLE	250	200	1856	WATTS	INCAND				
30	3	PEOPLE	250	200	5202	WATTS	INCAND				
35	5	PEOPLE	250	200	642	WATTS	INCAND				
40	10	PEOPLE	250	200	3026	WATTS	ASHRAE1				
45	4	PEOPLE	250	200	2296	WATTS	INCAND				
50	1	PEOPLE	250	200	558	WATTS	ASHRAE1				

Card 28----- Miscellaneous Equipment -----

Room	Misc	Energy	Energy	Energy	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Number	Equipment	Equipment	Consump	Consump	Schedule	Meter	of Load	Misc. Load	Misc. Sens	Radiant	Optional
	Number	Descrip	Value	Units	Code	Code	Sensible	to Room	to Ret. Air	Fraction	Air Path
5	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
10	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
15	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
20	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
25	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
30	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
35	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
40	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
45	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
50	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					

Card 29----- Room Airflows -----

Room	-----Ventilation-----				-----Infiltration-----				--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	280	CFM	280	CFM						
10	100	CFM	100	CFM						
15	4700	CFM	4700	CFM						
20	0	CFM	0	CFM						

Card 29----- Room Airflows -----										
-----Ventilation-----					-----Infiltration-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
25	0	CFM	0	CFM						
30	285	CFM	285	CFM						
35	790	CFM	790	CFM						
40	750	CFM	750	CFM						
45	3600	CFM	3600	CFM						
50	360	CFM	360	CFM						

Card 30----- Fan Airflows -----										
-----Main-----					-----Auxiliary-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Room Exhaust--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	5892	CFM	5892	CFM						
10	3344	CFM	3344	CFM						
15	10758	CFM	10758	CFM					600	CFM
20	15667	CFM	15667	CFM						
25	10386	CFM	10386	CFM						
30	2850	CFM	2850	CFM						
35	4080	CFM	4080	CFM						
40	12510	CFM	12510	CFM						
45	3600	CFM	3600	CFM						
50	1880	CFM	1880	CFM						

----- System Section Alternative #2 -----

## Card 39- System Alternative

Number	Description
2	EXISTING AIRSIDE EQUIPMENT

## Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----							
System	Ventil						Fan
Set	System	Deck	Cooling	Heating	Cooling	Heating	Static
Number	Type	Location	SADBVh	SADBVh	Schedule	Schedule	Pressure
1	TRH						
2	TRH						
3	TRH						
4	VTCV						
5	VTCV						
6	VTCV						
7	VTCV						

## Card 40----- System Type -----

```

-----OPTIONAL VENTILATION SYSTEM-----
System          Ventil          Fan
Set   System    Deck      Cooling Heating Cooling Heating .Static
Number Type      Location SADBvh  SADBvh  Schedule Schedule Pressure
8      VTCV
9      VTCV
10     VTCV

```

## Card 41----- Zone Assignment -----

```

System
Set          Ref #1          Ref #2          Ref #3          Ref #4          Ref #5          Ref #6
Number      Begin   End    Begin   End    Begin   End    Begin   End    Begin   End    Begin   End
1           1       1
2           2       2
3           3       3
4           4       4
5           5       5
6           6       6
7           7       7
8           8       8
9           9       9
10          10      10

```

## Card 42----- Fan SP and Duct Parameters-----

```

System Cool Heat Return Mn Exh Aux Rm Exh Cool Return Supply Supply Return
Set   Fan  Fan  Fan  Fan  Fan  Fan  Fan Mtr Fan Mtr Duct Duct Air
Number SP   SP   SP   SP   SP   SP   Loc   Loc   Ht Gn  Loc  Path
1      1.5
2      1.6
3      1.9          .5
4      1.6
5      1.6
6      4.6
7      2.0
8      2.0
9      1.5
10     2.0

```

## Card 43----- Airflow Design Temperatures -----

```

System Minimum Maximum Minimum Maximum Minimum Maximum Minimum Maximum Minimum Design
Set   Cooling Cooling Heating Heating Cooling Cooling Preheat Preheat Room   Ht Rec
Number SADB  SADB  SADB  SADB  Lv DB  Lv DB  Lv DB  Lv DB  RH    Diff
1      48.4  48.4
2      48.4  48.4

```

## Card 43----- Airflow Design Temperatures -----

System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff
3	47.4	47.4								

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1						OFF				
2						OFF				
3						OFF				
4						OFF				
5						OFF				

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1	AVAIL								
2	AVAIL								
3	AVAIL								

## ----- Equipment Section Alternative #2 -----

## Card 59----- Equipment Description / TOD Schedules -----

	Elec Consump	Elec Demand	Demand	----- Demand Limit ----		
Alternative	Time of Day	Time of Day	Limit	Temperature		
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
2				EXISTING PRIMARY EQUIPMENT		

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1		1	10								

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1001S	1	151	TONS	141	KW					1	PAR	
2	EQ1001S	1	151	TONS	141	KW					2	PAR	

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---		-----CONDENSER-----		---HT REC or AUX---		Switch-					
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.		
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.		
1	27.3	KW	13.2	KW					1	1		
2	28.7	KW	10.5	KW					2	2		

Card 65----- Heating Load Assignment -----

Load	All Coil											
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-		
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin
1	1	1	3	6	10							

Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy		Seq	Switch	Demand						
Ref	Code	Of	Full Ld	Cap'y	Rate	Order	over	Hot	Misc.	Limit				
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BLR51	1	2.7	KW	1060	MBH	1683	MBH	1				3	
2	BLR51	1	2.7	KW	1060	MBH	1683	MBH	2				4	

Card 69----- Fan Equipment Parameters -----

System	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Set	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
Number							
1	EQ4003						
2	EQ4003						
3	EQ4003						
4	EQ4003						
5	EQ4003						
6	EQ4003						
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						

Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----								--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY----		
System	Cool	Heat	Ret	Exh	Aux	Room	Opt						
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Room	Opt	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan	Fan
1	4.9												



## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----								--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY---			
System	Cool	Heat	Ret	Exh	Aux	Room	Opt				Room	Opt		
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent		
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan		
2	1.7													
3	8.6													
4	4.4													
5	4.1													
6	4.9													
7	8.7													
8	10.3													
9	2.1													
10	4.1													

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW LOADS	45.6	TONS	AVAIL	CHILL-LD	1			
2	HW LOADS	90.9	MBH	AVAIL	HOT-LD	1			
3	ALL OTHER LIGHTS	7.026	KW	OFICEL24	ELEC				
4	ESH-53	22.4	KW	ESH53	ELEC				

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value
1	EQ5100			5.3	KW	T-WATER	CTOWER	1		
2	EQ5100			5.3	KW	T-WATER	CTOWER	1		

## Card 75----- Miscellaneous Accessory -----

#1				#2				#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
1	EQ5013	22.3	KW									
2	EQ5013	22.3	KW									
3	EQ5020	6.4	KW									
4	EQ5020	7.2	KW									

## ----- Load Section Alternative #3 -----

Card 19- Load Alternative -

Number Description  
3 ECO B - OCCUPANCY SENSOR UPGRADE

**ECO-B, TEST CELLS 1 & 2**

Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
5	1	DEVICE RM. A-104	69	33	8	0	1	32			
10	2	DEVICE RM B-105	32	41	8	0	1	29			
15	3	RM 102, 103	59	36	8	0	1	32			
20	4	RM 109	26	44	8	0	1	16			
25	5	PT ELEC RM 201	27	37	8	0	1	17			
30	6	RM. 101,102,105	46	46	8	0	1	15			
35	7	RM 102	24	30	8	0	1	15			
40	8	RM 204,301,401	57	57	8	0	1	15			
45	9	HPOC, 501	25	24	8	0	1	15			
50	10	ETA CNTRL RM 103	25.5	13	8	0	1	15			

Card 21----- Thermostat Parameters -----

Room Number	Cooling Room Design DB	Room Design RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
5	70	50	70		70	70				NO
10	70	50	70		70	70				NO
15	70	50	70		70	70				NO
20	70	50	70		70	70				NO
25	70	50	70		70	70				NO
30	70	50	70		70	70				NO
35	70	50	70		70	70				NO
40	70	50	70		70	70				NO
45	70	50	70		70	70				NO
50	70	50	70		70	70				NO

Card 22----- Roof Parameters -----

Room Number	Roof Number	Roof Equal to Floor?	Roof Length	Roof Width	Roof U-Value	Const Type	Roof Direction	Roof Tilt	Roof Alpha
5	1	YES			0.1	23			
10	1	YES			0.1	23			
15	1		69	36	0.1	23			
25	1	YES			0.1	23			
30	1	YES			0.1	23			
45	1	YES			0.32	23			
50	1	YES			0.32	23			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall		Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc	Type				Reflectance Multiplier
5	1	33	32	0.32	58		315			
5	2	69	32	0.32	58		45			
10	1	32	29	0.32	58		315			
10	2	29.5	29.5	0.32	58		225			
15	1	38	32	0.32	58		315			
15	2	38	32	0.32	58		135			
20	1	27	16	0.32	58		135			
25	1	27	17	0.32	58		135			
30	1	78	15	0.32	58		315			
30	2	43	15	0.32	58		45			
30	3	42	15	0.32	58		135			
30	4	30	15	0.32	58		225			
40	1	75	15	0.32	58		315			
40	2	75	15	0.32	58		45			
40	3	75	15	0.32	58		135			
40	4	75	15	0.32	58		225			
45	1	25	15	0.32	58		315			
45	2	24	15	0.32	58		45			
45	3	25	15	0.32	58		135			
45	4	24	15	0.32	58		225			
50	1	13	15	0.32	58		45			
50	2	25.5	15	0.32	58		135			
50	3	8	15	0.32	58		225			

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	OFFICEP1	OFICEL30								
10	OFFICEP1	CLGONLY								
15	OFFICEP1	CLGONLY								
20	OFFICEP1	CLGONLY								
25	OFFICEP1	CLGONLY								
30	OFFICEP1	OFICEL31								
35	OFFICEP1	CLGONLY								
40	OFFICEP1	OFICEL32								
45	OFFICEP1	OFICEL33								
50	OFFICEP1	OFICEL35								

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting		Percent Lights to Ret. Air	--- Daylighting ---	
							Fixture Type	Ballast Factor		Reference Point 1	Reference Point 2
5	2	PEOPLE	250	200	15118	WATTS	INCAND				
10	2	PEOPLE	250	200	7454	WATTS	INCAND				

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting		Ballast Factor	Percent		--- Daylighting ---	
							Fixture Type			Lights to Ret. Air	Reference Point 1	Reference Point 2	
15	4	PEOPLE	250	200	5084	WATTS	INCAND						
20	2	PEOPLE	250	200	2148	WATTS	INCAND						
25	5	PEOPLE	250	200	1856	WATTS	INCAND						
30	3	PEOPLE	250	200	5202	WATTS	INCAND						
35	5	PEOPLE	250	200	642	WATTS	INCAND						
40	10	PEOPLE	250	200	3026	WATTS	ASHRAE1						
45	4	PEOPLE	250	200	2296	WATTS	INCAND						
50	1	PEOPLE	250	200	558	WATTS	ASHRAE1						

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment		Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent		Percent		Percent		Optional Air Path
	Number	Descrip					of Load Sensible	Load to Room	Misc. Load to Ret. Air	Misc. Sens to Ret. Air	Radiant Fraction		
5	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
10	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
15	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
20	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
25	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
30	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
35	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
40	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
45	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							
50	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC							

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----				-----Infiltration-----				--Reheat Minimum--	
	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		Value	Units
5	280	CFM	280	CFM						
10	100	CFM	100	CFM						
15	4700	CFM	4700	CFM						
20	0	CFM	0	CFM						
25	0	CFM	0	CFM						
30	285	CFM	285	CFM						
35	790	CFM	790	CFM						
40	750	CFM	750	CFM						
45	3600	CFM	3600	CFM						
50	360	CFM	360	CFM						

Card 30----- Fan Airflows -----

Room Number	-----Main-----				-----Auxiliary-----				--Room Exhaust--	
	----Cooling----		----Heating----		----Cooling----		----Heating----		Value	Units
	Value	Units	Value	Units	Value	Units	Value	Units		
5	5892	CFM	5892	CFM						
10	3344	CFM	3344	CFM						
15	10758	CFM	10758	CFM					600	CFM
20	15667	CFM	15667	CFM						
25	10386	CFM	10386	CFM						
30	2850	CFM	2850	CFM						
35	4080	CFM	4080	CFM						
40	12510	CFM	12510	CFM						
45	3600	CFM	3600	CFM						
50	1880	CFM	1880	CFM						

----- System Section Alternative #3 -----

Card 39- System Alternative

Number	Description
3	EXISTING AIRSIDE EQUIPMENT

Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----

Set Number	System Type	Ventil		Cooling		Heating		Fan	
		Deck Location	SADBVh	SADBVh	Schedule	Schedule	Static Pressure		
1	TRH								
2	TRH								
3	TRH								
4	VTCV								
5	VTCV								
6	VTCV								
7	VTCV								
8	VTCV								
9	VTCV								
10	VTCV								

Card 41----- Zone Assignment -----

System Set Number	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1										
2	2	2										
3	3	3										
4	4	4										
5	5	5										
6	6	6										
7	7	7										

## Card 41----- Zone Assignment -----

## System

Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
9	9	9										
10	10	10										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.5										
2	1.6										
3	1.9					.5					
4	1.6										
5	1.6										
6	4.6										
7	2.0										
8	2.0										
9	1.5										
10	2.0										

## Card 43----- Airflow Design Temperatures -----

System	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Design
Set	Cooling	Cooling	Heating	Heating	Cooling	Cooling	Preheat	Preheat	Room	Ht Rec	
Number	SADB	SADB	SADB	SADB	Lv DB	Lv DB	Lv DB	Lv DB	RH	Diff	
1	48.4	48.4									
2	48.4	48.4									
3	47.4	47.4									

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main			Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1						OFF				
2						OFF				
3						OFF				
4						OFF				
5						OFF				

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1	AVAIL								

Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
2	AVAIL								
3	AVAIL								

----- Equipment Section Alternative #3 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	----- Demand Limit -----		
Number	Time of Day	Time of Day	Limit	Temperature		
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
3				EXISTING PRIMARY EQUIPMENT		

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1		1	10								

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref	Code	Of	--Capacity--	---Energy---	--Capacity--	---Energy---	Order	Seq	Limit				
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1001S	1	151	TONS	141	KW					1	PAR	
2	EQ1001S	1	151	TONS	141	KW					2	PAR	

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-								
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.	
Num	Value	Units	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	27.3	KW	13.2	KW							1	1
2	28.7	KW	10.5	KW							2	2

Card 65----- Heating Load Assignment -----

Load	All Coil										
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	1	3	6	10						

## Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Energy Cap'y	Seq Order	Switch over	Hot	Misc.	Demand Limit
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number
1	BLR51	1	2.7	KW	1060	MBH	1683	MBH	1
2	BLR51	1	2.7	KW	1060	MBH	1683	MBH	2

## Card 69----- Fan Equipment Parameters -----

System

Set Number	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
1	EQ4003						
2	EQ4003						
3	EQ4003						
4	EQ4003						
5	EQ4003						
6	EQ4003						
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						

## Card 70----- Fan Equipment KW Overrides -----

System Set Number	---MAIN SYSTEM---			--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY---					
	Cool Fan	Heat Fan	Ret Fan	Exh Fan	Aux Sup	Room Exh	Opt Vent	Cool Fan	Heat Fan	Aux Fan	Room Exh	Opt Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	4.9											
2	1.7											
3	8.6											
4	4.4											
5	4.1											
6	4.9											
7	8.7											
8	10.3											
9	2.1											
10	4.1											

## Card 71----- Base Utility Parameters -----

Base Utility Number	Base Utility Descrip	Hourly Demand Value	Hourly Demand Units	Schedule Code	Energy Type	Equip Reference Number	Demand Limiting Number	Entering Temp	Leaving Temp
1	CHW LOADS	45.6	TONS	AVAIL	CHILL-LD	1			



## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
2	HW LOADS	90.9	MBH	AVAIL	HOT-LD	1			
3	ALL OTHER LIGHTS	7.026	KW	OFICEL34	ELEC				
4	ESH-53	22.4	KW	ESH53	ELEC				

## Card 74----- Condenser / Cooling Tower Parameters -----

	Cooling		Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd
1	EQ5100			5.3	KW	T-WATER	CTOWER	1	
2	EQ5100			5.3	KW	T-WATER	CTOWER	1	

## Card 75----- Miscellaneous Accessory -----

	#1				#2					#3			
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code	
1	EQ5013	22.3	KW										
2	EQ5013	22.3	KW										
3	EQ5020	6.4	KW										
4	EQ5020	7.2	KW										

## ----- Load Section Alternative #4 -----

**ECO-C, TEST CELLS 1 & 2**

## Card 19- Load Alternative -

Number	Description
4	ECO C - ENERGY MANAGEMENT SYSTEM

## Card 20----- General Room Parameters -----

	Zone							Acoustic	Floor to	Duplicate	Duplicate	Perimeter
Room	Reference	Room	Floor	Floor	Const	Plenum	Ceiling	Floor	Floors	Rooms per		Depth
Number	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Multiplier	Zone		
5	1	DEVICE RM. A-104	69	33	8	0	1	32				
10	2	DEVICE RM B-105	32	41	8	0	1	29				
15	3	RM 102, 103	59	36	8	0	1	32				
20	4	RM 109	26	44	8	0	1	16				
25	5	PT ELEC RM 201	27	37	8	0	1	17				
30	6	RM. 101,102,105	46	46	8	0	1	15				
35	7	RM 102	24	30	8	0	1	15				
40	8	RM 204,301,401	57	57	8	0	1	15				

Card 20----- General Room Parameters -----											
Zone						Acoustic			Floor to	Duplicate	Duplicate
Room	Reference	Room	Floor	Floor	Const	Plenum	Ceiling	Floor	Floors	Rooms per	Perimeter
Number	Number	Descrip	Length	Width	Type	Height	Resistance	Height	Multiplier	Zone	Depth
45	9	HPOC, 501	25	24	8	0	1	15			
50	10	ETA CNTRL RM 103	25.5	13	8	0	1	15			

Card 21----- Thermostat Parameters -----											
Cooling		Room	Cooling	Cooling	Heating	Heating	Heating	T'stat	Mass /	Carpet	
Room	Room	Design	T'stat	T'stat	Room	T'stat	T'stat	Location	No. Hrs	On	
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor	
5	70	50	70		70	70				NO	
10	70	50	70		70	70				NO	
15	70	50	70		70	70				NO	
20	70	50	70		70	70				NO	
25	70	50	70		70	70				NO	
30	70	50	70		70	70				NO	
35	70	50	70		70	70				NO	
40	70	50	70		70	70				NO	
45	70	50	70		70	70				NO	
50	70	50	70		70	70				NO	

Card 22----- Roof Parameters -----									
Roof									
Room	Roof	Equal to	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	YES			0.1	23			
10	1	YES			0.1	23			
15	1		69	36	0.1	23			
25	1	YES			0.1	23			
30	1	YES			0.1	23			
45	1	YES			0.32	23			
50	1	YES			0.32	23			

Card 24----- Wall Parameters -----										
Wall								Ground		
Room	Wall	Wall	Wall	Wall	Constuc	Wall	Wall	Wall	Reflectance	
Number	Number	Length	Height	U-Value	Type	Direction	Tilt	Alpha	Multiplier	
5	1	33	32	0.32	58	315				
5	2	69	32	0.32	58	45				
10	1	32	29	0.32	58	315				
10	2	29.5	29.5	0.32	58	225				
15	1	38	32	0.32	58	315				
15	2	38	32	0.32	58	135				
20	1	27	16	0.32	58	135				

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
25	1	27	17	0.32	58	135			
30	1	78	15	0.32	58	315			
30	2	43	15	0.32	58	45			
30	3	42	15	0.32	58	135			
30	4	30	15	0.32	58	225			
40	1	75	15	0.32	58	315			
40	2	75	15	0.32	58	45			
40	3	75	15	0.32	58	135			
40	4	75	15	0.32	58	225			
45	1	25	15	0.32	58	315			
45	2	24	15	0.32	58	45			
45	3	25	15	0.32	58	135			
45	4	24	15	0.32	58	225			
50	1	13	15	0.32	58	45			
50	2	25.5	15	0.32	58	135			
50	3	8	15	0.32	58	225			

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	OFFICEP1	OFICEL30	OFFICEP1							
10	OFFICEP1	CLGONLY	OFFICEP1							
15	OFFICEP1	CLGONLY	OFFICEP1							
20	OFFICEP1	CLGONLY	OFFICEP1							
25	OFFICEP1	CLGONLY	OFFICEP1							
30	OFFICEP1	OFICEL31	OFFICEP1							
35	OFFICEP1	CLGONLY	OFFICEP1							
40	OFFICEP1	OFICEL32	OFFICEP1							
45	OFFICEP1	OFICEL33	OFFICEP1							
50	OFFICEP1	OFICEL35	OFFICEP1							

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---	
							Fixture Type			Reference Point 1	Reference Point 2
5	2	PEOPLE	250	200	15118	WATTS	INCAND				
10	2	PEOPLE	250	200	7454	WATTS	INCAND				
15	4	PEOPLE	250	200	5084	WATTS	INCAND				
20	2	PEOPLE	250	200	2148	WATTS	INCAND				
25	5	PEOPLE	250	200	1856	WATTS	INCAND				
30	3	PEOPLE	250	200	5202	WATTS	INCAND				
35	5	PEOPLE	250	200	642	WATTS	INCAND				
40	10	PEOPLE	250	200	3026	WATTS	ASHRAE1				

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting		Ballast Factor	Percent	--- Daylighting ---	
							Fixture Type	Incand		Lights to Ret. Air	Reference Point 1	Reference Point 2
45	4	PEOPLE	250	200	2296	WATTS	INCAND					
50	1	PEOPLE	250	200	558	WATTS	ASHRAE1					

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Units	Schedule Code	Energy Meter Code	Percent	Percent	Percent	Radiant Fraction	Optional Air Path
							of Load Sensible	Misc. Load to Room	Misc. Sens to Ret. Air		
5	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
10	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
15	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
20	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
25	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
30	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
35	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
40	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
45	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
50	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					

## Card 29----- Room Airflows -----

Room Number	-----Ventilation-----		-----Infiltration-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--	
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	20	CFM-P	20	CFM-P						
10	20	CFM-P	20	CFM-P						
15	20	CFM-P	20	CFM-P						
20	0	CFM	0	CFM						
25	0	CFM	0	CFM						
30	160	CFM	160	CFM						
35	140	CFM	140	CFM						
40	20	CFM-P	20	CFM-P						
45	3600	CFM	3600	CFM						
50	20	CFM-P	20	CFM-P						

## Card 30----- Fan Airflows -----

Room Number	-----Main-----		-----Auxiliary-----		-----Cooling-----		-----Heating-----		--Room Exhaust--	
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	5892	CFM	5892	CFM						
10	3344	CFM	3344	CFM						
15	10758	CFM	10758	CFM					600	CFM
20	15667	CFM	15667	CFM						

Card 30----- Fan Airflows -----

Room	-----Main-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Room Exhaust--	
	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
25	10386	CFM	10386	CFM						
30	2850	CFM	2850	CFM						
35	4080	CFM	4080	CFM						
40	12510	CFM	12510	CFM						
45	3600	CFM	3600	CFM						
50	1880	CFM	1880	CFM						

----- System Section Alternative #4 -----

Card 39- System Alternative

Number	Description
4	AIRSIDE EQ WITH NEW CONTROLS

Card 40----- System Type -----

System Set Number	System Type	Ventil		Cooling		Heating		Fan
		Deck	Location	SADBVh	SADBVh	Schedule	Schedule	Static Pressure
1	TRH							
2	TRH							
3	TRH							
4	VTCV							
5	VTCV							
6	VTCV							
7	VTCV							
8	VTCV							
9	VTCV							
10	VTCV							

Card 41----- Zone Assignment -----

System Set Number	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1										
2	2	2										
3	3	3										
4	4	4										
5	5	5										
6	6	6										
7	7	7										

## Card 41----- Zone Assignment -----

System

Set	Ref #1		Ref #2		Ref #3		Ref #4		Ref #5		Ref #6	
Number	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
8	8	8										
9	9	9										
10	10	10										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.5										
2	1.6										
3	1.9										
4	1.6										
5	1.6										
6	4.6										
7	2.0										
8	2.0										
9	1.5										
10	2.0										

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery						
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --	-- Control Type --	-- Exh-Side Deck --			
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2
1	DRY-BULB	65	100										
2	DRY-BULB	65	100										
3	DRY-BULB	65	100										
8	DRY-BULB	65	100										

## Card 45----- Equipment Schedules -----

System	Main		Direct	Indirect	Auxiliary	Main	Main		Auxiliary
Set	Cooling		Evap	Evap	Cooling	Heating	Preheat	Reheat	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Coil	Humidity Coil
1	AVAIL	AVAIL				OFF			
2	AVAIL	AVAIL				OFF			
3	AVAIL	AVAIL				OFF			
4						OFF			
5						OFF			
8	AVAIL	AVAIL							

Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----				System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust	
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule	
1	AVAIL									
2	AVAIL									
3	AVAIL									

----- Equipment Section Alternative #4 -----

Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	---- Demand Limit ---	
Number	Time of Day	Time of Day	Limit	Temperature	Drift
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule
4				PRIMARY EQ WITH NEW CONTROLS	

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling											
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-		
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End		
1	1		1	10									

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----				-----HEAT RECOVERY-----				Seq	Demand		
Ref	Code	Of	--Capacity--	Value	Units	Value	Units	Value	Units	Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number
1	EQ1001S	1	151	TONS	141	KW					1	PAR	
2	EQ1001S	1	151	TONS	141	KW					2	PAR	

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-								
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.	
Num	Value	Units	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	27.3	KW	13.2	KW							1	1
2	28.7	KW	10.5	KW							2	2

Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej			
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref	To Ref	@ HW	
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type	Number	Temp	
1	10					85	55				
2	10					85	55				

Card 65----- Heating Load Assignment -----

Load	All Coil										
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
1	1	1	3	6	10						

Card 67----- Heating Equipment Parameters -----

Heat Ref	Equip Code	Number Of	HW Pmp Full Ld	Cap'y	Energy Rate	Seq Order	Switch over	Hot	Misc.	Demand Limit				
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	BLR51	1	2.7	KW	1060	MBH	1683	MBH	1				3	
2	BLR51	1	2.7	KW	1060	MBH	1683	MBH	2				4	

Card 69----- Fan Equipment Parameters -----

System Set	Cooling Fan	Heating Fan	Return Fan	Exhaust Fan	Auxiliary Supply	Room Exhaust	Optional Ventilation
Number							
1	EQ4003						
2	EQ4003						
3	EQ4003						
4	EQ4003						
5	EQ4003						
6	EQ4003						
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						

Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----								--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY----		
System Set	Cool Fan	Heat Fan	Ret Fan	Exh Fan	Aux Sup	Room Exh	Opt Vent	Cool Fan	Heat Fan	Aux Fan	Exh Fan	Opt Vent	
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan	
1	4.9												
2	1.7												
3	8.6												
4	4.4												
5	4.1												
6	4.9												
7	8.7												
8	10.3												
9	2.1												
10	4.1												



## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW LOADS	45.6	TONS	AVAIL	CHILL-LD	1			
2	HW LOADS	90.9	MBH	AVAIL	HOT-LD	1			
3	ALL OTHER LIGHTS	7.026	KW	OFICEL34	ELEC				

## Card 74----- Condenser / Cooling Tower Parameters -----

	Cooling		Energy	Energy		Number	Percent	Low Spd	Low Spd		
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value	Units
1	EQ5100			5.3	KW	T-WATER	CTOWER	1			
2	EQ5100			5.3	KW	T-WATER	CTOWER	1			

## Card 75----- Miscellaneous Accessory -----

	#1				#2					#3			
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code	
1	EQ5013	22.3	KW										
2	EQ5013	22.3	KW										
3	EQ5020	6.4	KW										
4	EQ5020	7.2	KW										

## 01 Card - Job Information

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Project: EEAP ENERGY STUDY - HELSTP  
 Location: WHITE SANDS - ALAMOGORDO, NEW MEXICO  
 Client: FORT WORTH CORPS OF ENGINEERS  
 Program User: HUITT-ZOLLARS, INC.  
 Comments: TEST CELL # 1 AND TEST CELL # 2

## Card 08----- Climatic Information -----

	Summer	Winter	Summer	Summer	Winter		Summer	Winter
Weather	Clearness	Clearness	Design	Design	Design	Building	Ground	Ground
Code	Number	Number	Dry Bulb	Wet Bulb	Dry Bulb	Orientation	Reflect	Reflect

HOLLOMAN

## ----- Load Section Alternative #1 -----

**ECO-E, TEST CELLS 1 & 2**

## Card 19- Load Alternative -

Number	Description
1	ECO E - HIGH EFFICIENCY MOTORS

## Card 20----- General Room Parameters -----

Room Number	Zone Reference Number	Room Descrip	Floor Length	Floor Width	Const Type	Plenum Height	Acoustic Ceiling Resistance	Floor to Floor Height	Duplicate Floors Multiplier	Duplicate Rooms per Zone	Perimeter Depth
5	1	DEVICE RM. A-104	69	33	8	0	1	32			
10	2	DEVICE RM B-105	32	41	8	0	1	29			
15	3	RM 102, 103	59	36	8	0	1	32			
20	4	RM 109	26	44	8	0	1	16			
25	5	PT ELEC RM 201	27	37	8	0	1	17			
30	6	RM. 101,102,105	46	46	8	0	1	15			
35	7	RM 102	24	30	8	0	1	15			
40	8	RM 204,301,401	57	57	8	0	1	15			
45	9	HPOC, 501	25	24	8	0	1	15			
50	10	ETA CNTRL RM 103	25.5	13	8	0	1	15			

## Card 21----- Thermostat Parameters -----

Room Number	Cooling Room Design DB	Room RH	Cooling T'stat Driftpoint	Cooling T'stat Schedule	Heating Room Design DB	Heating T'stat Driftpoint	Heating T'stat Schedule	Heating T'stat Location Flag	Mass / No. Hrs Average	Carpet On Floor
5	70	50	70		70	70				NO

## Card 21----- Thermostat Parameters -----

Room	Cooling Room	Room Design	Cooling T'stat	Cooling T'stat	Heating Room	Heating T'stat	Heating T'stat	Heating T'stat	T'stat Location	Mass / No. Hrs	Carpet On
Number	Design DB	RH	Driftpoint	Schedule	Design DB	Driftpoint	Schedule	Flag	Average	Floor	
10	70	50	70		70	70					NO
15	70	50	70		70	70					NO
20	70	50	70		70	70					NO
25	70	50	70		70	70					NO
30	70	50	70		70	70					NO
35	70	50	70		70	70					NO
40	70	50	70		70	70					NO
45	70	50	70		70	70					NO
50	70	50	70		70	70					NO

## Card 22----- Roof Parameters -----

Room	Roof	Roof	Roof	Roof	Roof	Const	Roof	Roof	Roof
Number	Number	Equal to Floor?	Length	Width	U-Value	Type	Direction	Tilt	Alpha
5	1	YES			0.1	23			
10	1	YES			0.1	23			
15	1		69	36	0.1	23			
25	1	YES			0.1	23			
30	1	YES			0.1	23			
45	1	YES			0.32	23			
50	1	YES			0.32	23			

## Card 24----- Wall Parameters -----

Room	Wall	Wall	Wall	Wall	Wall	Constuc	Wall	Wall	Wall	Ground
Number	Number	Length	Height	U-Value	Type	Type	Direction	Tilt	Alpha	Reflectance Multiplier
5	1	33	32	0.32	58		315			
5	2	69	32	0.32	58		45			
10	1	32	29	0.32	58		315			
10	2	29.5	29.5	0.32	58		225			
15	1	38	32	0.32	58		315			
15	2	38	32	0.32	58		135			
20	1	27	16	0.32	58		135			
25	1	27	17	0.32	58		135			
30	1	78	15	0.32	58		315			
30	2	43	15	0.32	58		45			
30	3	42	15	0.32	58		135			
30	4	30	15	0.32	58		225			
40	1	75	15	0.32	58		315			
40	2	75	15	0.32	58		45			
40	3	75	15	0.32	58		135			
40	4	75	15	0.32	58		225			

## Card 24----- Wall Parameters -----

Room Number	Wall Number	Wall Length	Wall Height	Wall U-Value	Wall	Wall Direction	Wall Tilt	Wall Alpha	Ground
					Constuc Type				Reflectance Multiplier
45	1	25	15	0.32	58	315			
45	2	24	15	0.32	58	45			
45	3	25	15	0.32	58	135			
45	4	24	15	0.32	58	225			
50	1	13	15	0.32	58	45			
50	2	25.5	15	0.32	58	135			
50	3	8	15	0.32	58	225			

## Card 26----- Schedules -----

Room Number	People	Lights	Ventilation	Infiltration	Reheat Minimum	Cooling Fans	Heating Fan	Auxiliary Fan	Room Exhaust	Daylighting Controls
5	OFFICEP1	OFICEL30	OFFICEP1							
10	OFFICEP1	CLGONLY	OFFICEP1							
15	OFFICEP1	CLGONLY	OFFICEP1							
20	OFFICEP1	CLGONLY	OFFICEP1							
25	OFFICEP1	CLGONLY	OFFICEP1							
30	OFFICEP1	OFICEL31	OFFICEP1							
35	OFFICEP1	CLGONLY	OFFICEP1							
40	OFFICEP1	OFICEL32	OFFICEP1							
45	OFFICEP1	OFICEL33	OFFICEP1							
50	OFFICEP1	OFICEL35	OFFICEP1							

## Card 27----- People and Lights -----

Room Number	People Value	People Units	People Sensible	People Latent	Lighting Value	Lighting Units	Lighting Fixture Type	Ballast Factor	Percent Lights to Ret. Air	--- Daylighting ---	
										Reference Point 1	Reference Point 2
5	2	PEOPLE	250	200	15118	WATTS	INCAND				
10	2	PEOPLE	250	200	7454	WATTS	INCAND				
15	4	PEOPLE	250	200	5084	WATTS	INCAND				
20	2	PEOPLE	250	200	2148	WATTS	INCAND				
25	5	PEOPLE	250	200	1856	WATTS	INCAND				
30	3	PEOPLE	250	200	5202	WATTS	INCAND				
35	5	PEOPLE	250	200	642	WATTS	INCAND				
40	10	PEOPLE	250	200	3026	WATTS	ASHRAE1				
45	4	PEOPLE	250	200	2296	WATTS	INCAND				
50	1	PEOPLE	250	200	558	WATTS	ASHRAE1				

## Card 28----- Miscellaneous Equipment -----

Room Number	Misc Equipment Number	Equipment Descrip	Energy		Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
			Consump Value	Consump Units							
5	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					

Card 28----- Miscellaneous Equipment -----											
Room	Misc Equipment Number	Equipment Descrip	Energy Consump Value	Energy Consump Units	Schedule Code	Energy Meter Code	Percent of Load Sensible	Percent Misc. Load to Room	Percent Misc. Sens to Ret. Air	Radiant Fraction	Optional Air Path
10	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
15	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
20	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
25	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
30	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
35	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
40	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
45	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					
50	1	TESTING EQ,COMP.	2.46	WATT-SF	OFFICEM1	ELEC					

Card 29----- Room Airflows -----									
-----Ventilation-----					-----Infiltration-----				
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Reheat Minimum--
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value Units
5	20	CFM-P	20	CFM-P					
10	20	CFM-P	20	CFM-P					
15	20	CFM-P	20	CFM-P					
20	0	CFM	0	CFM					
25	0	CFM	0	CFM					
30	160	CFM	160	CFM					
35	140	CFM	140	CFM					
40	20	CFM-P	20	CFM-P					
45	3600	CFM	3600	CFM					
50	20	CFM-P	20	CFM-P					

Card 30----- Fan Airflows -----										
-----Main-----					-----Auxiliary-----					
Room	-----Cooling-----		-----Heating-----		-----Cooling-----		-----Heating-----		--Room Exhaust--	
Number	Value	Units	Value	Units	Value	Units	Value	Units	Value	Units
5	5892	CFM	5892	CFM						
10	3344	CFM	3344	CFM						
15	10758	CFM	10758	CFM					600	CFM
20	15667	CFM	15667	CFM						
25	10386	CFM	10386	CFM						
30	2850	CFM	2850	CFM						
35	4080	CFM	4080	CFM						
40	12510	CFM	12510	CFM						
45	3600	CFM	3600	CFM						
50	1880	CFM	1880	CFM						

## ----- System Section Alternative #1 -----

## Card 39- System Alternative

Number	Description
1	AIRSIDE EQ WITH NEW MOTORS

## Card 40----- System Type -----

-----OPTIONAL VENTILATION SYSTEM-----

System Set	System Type	Ventil Deck Location	Cooling SADBvh	Heating SADBvh	Cooling Schedule	Heating Schedule	Fan Static Pressure
1	TRH						
2	TRH						
3	TRH						
4	VTCV						
5	VTCV						
6	VTCV						
7	VTCV						
8	VTCV						
9	VTCV						
10	VTCV						

## Card 41----- Zone Assignment -----

System Set	Ref #1	Ref #2	Ref #3	Ref #4	Ref #5	Ref #6
Number	Begin	End	Begin	End	Begin	End
1	1	1				
2	2	2				
3	3	3				
4	4	4				
5	5	5				
6	6	6				
7	7	7				
8	8	8				
9	9	9				
10	10	10				

## Card 42----- Fan SP and Duct Parameters-----

System Set	Cool Fan	Heat Fan	Return Fan	Mn Exh Fan	Aux Fan	Rm Exh Fan	Cool Fan Mtr	Return Fan Mtr	Supply Duct	Supply Duct	Return Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
1	1.5										
2	1.6										
3	1.9					.5					
4	1.6										
5	1.6										
6	4.6										

## Card 42----- Fan SP and Duct Parameters-----

System	Cool	Heat	Return	Mn Exh	Aux	Rm Exh	Cool	Return	Supply	Supply	Return
Set	Fan	Fan	Fan	Fan	Fan	Fan	Fan Mtr	Fan Mtr	Duct	Duct	Air
Number	SP	SP	SP	SP	SP	SP	Loc	Loc	Ht Gn	Loc	Path
7	2.0										
8	2.0										
9	1.5										
10	2.0										

## Card 44----- System Options -----

System	Econ	Econ	Max Pct	Direct	Indirect	1st Stage	Exhaust Air Heat Recovery -----						
Set	Type	On	Outside	Evap	Evap	Evap	Fan	-- Effectiveness --	-- Control Type --	-- Exh-Side Deck --			
Number	Flag	Point	Air	Cooling	Cooling	Cooling	Cycling	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2
1	DRY-BULB	65	100										
2	DRY-BULB	65	100										
3	DRY-BULB	65	100										
8	DRY-BULB	65	100										

## Card 45----- Equipment Schedules -----

System	Main	Direct	Indirect	Auxiliary	Main	Main	Auxiliary		
Set	Cooling	Evap	Evap	Cooling	Heating	Preheat	Reheat	Mech.	Heating
Number	Coil	Economizer	Coil	Coil	Coil	Coil	Coil	Humidity	Coil
1	AVAIL	AVAIL				OFF			
2	AVAIL	AVAIL				OFF			
3	AVAIL	AVAIL				OFF			
4						OFF			
5						OFF			
8	AVAIL	AVAIL							

## Card 46----- EMS/BAS Schedules -----

System	Discrim	Night	Optimum	Optimum	-----DUTY CYCLING-----			System HR	Room HR
Set	Control	Purge	Start	Stop	On Period	Pattern	Maximum	Exhaust	Exhaust
Number	Schedule	Schedule	Schedule	Schedule	Schedule	Length	Off Time	Schedule	Schedule
1	AVAIL								
2	AVAIL								
3	AVAIL								

## ----- Equipment Section Alternative #1 -----

## Card 59----- Equipment Description / TOD Schedules -----

Alternative	Elec Consump	Elec Demand	Demand	----- Demand Limit ---		
Number	Time of Day	Time of Day	Limit	Schedule	Temperature	Drift
Number	Schedule	Schedule	Max KW	Alternative Description	Schedule	Drift
1				PRIMARY EQ WITH NEW MOTORS		

Card 60----- Cooling Load Assignment-----  
 Load All Coil Cooling  
 Asgn Loads To Equipment -Group 1- -Group 2- -Group 3- -Group 4- -Group 5- -Group 6- -Group 7- -Group 8- -Group 9-  
 Ref Cool Ref Sizing Begin End Begin End Begin End Begin End Begin End Begin End Begin End Begin End  
 1 1 1 10

Card 62----- Cooling Equipment Parameters -----  
 Cool Equip Num -----COOLING----- -----HEAT RECOVERY----- Seq Demand  
 Ref Code Of --Capacity-- ----Energy---- --Capacity-- ----Energy---- Order Seq Limit  
 Num Name Units Value Units Value Units Value Units Value Units Value Units Num Type Number  
 1 EQ1001S 1 151 TONS 141 KW 1 PAR  
 2 EQ1001S 1 151 TONS 141 KW 2 PAR

Card 63----- Cooling Pumps and References -----  
 Cool ---CHILLED WATER--- ---CONDENSER--- ---HT REC or AUX--- Switch-  
 Ref Full Load Full Load Full Load Full Load Full Load Full Load Full Load over Cold Cooling Misc.  
 Num Value Units Value Units Value Units Control Storage Tower Access.  
 1 26.8 KW 13.0 KW 1 1  
 2 28.1 KW 10.6 KW 2 2

Card 64----- Cooling Equipment Options -----  
 Cool Max Load Free Cond Cond Cond Rej Cond Rej Cond Rej  
 Ref CW Shed Evap Cooling Heat Entering Min Oper To Ref To Ref @ HW  
 Num Reset Economizer Precool Type Source Temp Temp Type Number Temp  
 1 10 85 55  
 2 10 85 55

Card 65----- Heating Load Assignment -----  
 Load All Coil  
 Assignment Loads To -Group 1- -Group 2- -Group 3- -Group 4- -Group 5- -Group 6- -Group 7- -Group 8- -Group 9-  
 Reference Heating Ref Begin End Begin End Begin End Begin End Begin End Begin End Begin End Begin End  
 1 1 1 3 6 10

Card 67----- Heating Equipment Parameters -----  
 Heat Equip Number HW Pmp Energy Seq Switch Demand  
 Ref Code Of Full Ld Cap'y Rate Order over Hot Misc. Limit  
 Number Name Units Value Units Value Units Value Units Value Units Number Control Strg Acc. Cogen Number  
 1 BLR51 1 2.3 KW 1060 MBH 1683 MBH 1 3  
 2 BLR51 1 2.3 KW 1060 MBH 1683 MBH 2 4



## Card 69----- Fan Equipment Parameters -----

System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	EQ4003						
2	EQ4003						
3	EQ4003						
4	EQ4003						
5	EQ4003						
6	EQ4003						
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						

## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY---				
System	Cool	Heat	Ret	Exh	Aux	Room	Opt					
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	4.9											
2	1.4											
3	8.5											
4	4.4											
5	3.7											
6	4.7											
7	7.8											
8	9.9											
9	2.0											
10	4.2											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW LOADS	45.6	TONS	AVAIL	CHILL-LD	1			
2	HW LOADS	90.9	MBH	AVAIL	HOT-LD	1			
3	ALL OTHER LIGHTS	7.026	KW	OFICEL34	ELEC				

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling		Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Consump	Consump	Fluid	Tower	Of	Airflow	Energy
Ref	Code	Value	Units	Type	Type	Cells	Low Spd	Value
								Units
1	EQ5100	4.7	KW	T-WATER	CTOWER	1		
2	EQ5100	4.7	KW	T-WATER	CTOWER	1		

## Card 75----- Miscellaneous Accessory -----

#1				#2				#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
1	EQ5013	21.6	KW									
2	EQ5013	21.6	KW									
3	EQ5020	6.3	KW									
4	EQ5020	7.1	KW									

## ----- Equipment Section Alternative #2 -----

**ECO-G, TEST CELLS 1 & 2**

## Card 59----- Equipment Description / TOD Schedules -----

Elec Consump				Elec Demand		Demand		Demand Limit	
Alternative	Time of Day	Time of Day	Limit					Temperature	
Number	Schedule	Schedule	Max KW	Alternative	Description	Schedule	Drift		
2					NEW CHW & CND SYSTEM				

## Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling										
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1		1	10								

## Card 62----- Cooling Equipment Parameters -----

COOLING										HEAT RECOVERY				Seq	Demand
Ref	Code	Of	--Capacity--	--Energy--		--Capacity--		--Energy--		Order	Seq	Limit			
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number		
1	YCENT123	1	180	TONS	106	KW					1	PAR			
2	EQ1001S	1	151	TONS	141	KW					2	PAR			

## Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	---CONDENSER---	---HT REC or AUX---	Switch-						
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.
Num	Value	Units	Value	Units	Value	Units	Control	Storage	Tower	Access.
1	22.8	KW	10.33	KW					1	
2	28.7	KW	12.0	KW					2	

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
1	10					85	55	

## Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free	Cond	Cond	Cond Rej	Cond Rej	Cond Rej
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type
2	10					85	55	

## Card 65----- Heating Load Assignment -----

Load	All Coil										
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-	
Reference	Heating Ref	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	
1	1	1 3	6 10								

## Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp			Energy	Seq	Switch				Demand	
Ref	Code	Of	Full Ld		Cap'y	Rate	Order	over	Hot	Misc.		Limit	
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen
1	BLR51	1	2.3	KW	1060	MBH	1683	MBH	1			1	
2	BLR51	1	2.3	KW	1060	MBH	1683	MBH	2			2	

## Card 69----- Fan Equipment Parameters -----

System								
Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional	
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation	
1	EQ4003							
2	EQ4003							
3	EQ4003							
4	EQ4003							
5	EQ4003							
6	EQ4003							
7	EQ4003							
8	EQ4003							
9	EQ4003							
10	EQ4003							

## Card 70----- Fan Equipment KW Overrides -----

	-----MAIN SYSTEM-----				--OTHER SYSTEM--			----DEMAND LIMIT PRIORITY----			
System	Cool	Heat	Ret	Exh	Aux	Room	Opt				
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan
1	4.9										
2	1.4										

## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY----				
System	Cool	Heat	Ret	Exh	Aux	Room	Opt				Room	Opt
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
3	8.5											
4	4.4											
5	3.7											
6	4.7											
7	7.8											
8	9.9											
9	2.0											
10	4.2											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly		Equip	Demand			
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW LOADS	45.6	TONS	AVAIL	CHILL-LD	1			
2	HW LOADS	90.9	MBH	AVAIL	HOT-LD	1			
3	ALL OTHER LIGHTS	7.026	KW	OFICEL34	ELEC				

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value
1	EQ5100			4.7	KW	T-WATER	CTOWER	1		
2	EQ5100			4.7	KW	T-WATER	CTOWER	1		

## Card 75----- Miscellaneous Accessory -----

#1				#2				#3				
Misc	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched	Equip	Energy	Energy	Sched
Ref	Code	Value	Units	Code	Code	Value	Units	Code	Code	Value	Units	Code
1	EQ5020	6.3	KW									
2	EQ5020	7.1	KW									

## ----- Equipment Section Alternative #3 -----

## ECO-H, TEST CELLS 1 &amp; 2

## Card 59----- Equipment Description / TOD Schedules -----

Elec Consump				Elec Demand		Demand	---- Demand Limit ---	
Alternative	Time of Day	Time of Day	Limit				Temperature	
Number	Schedule	Schedule	Max KW	Alternative Description		Schedule	Drift	
3				NEW HW SYSTEM				

Card 60----- Cooling Load Assignment-----

Load	All Coil	Cooling											
Asgn	Loads To	Equipment	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-		
Ref	Cool Ref	Sizing	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1		1	10									

Card 62----- Cooling Equipment Parameters -----

Cool Equip	Num	-----COOLING-----						-----HEAT RECOVERY-----				Seq	Demand	
Ref	Code	Of	--Capacity--		---Energy---		--Capacity--		---Energy---		Order	Seq	Limit	
Num	Name	Units	Value	Units	Value	Units	Value	Units	Value	Units	Num	Type	Number	
1	YCENT123	1	180	TONS	106	KW					1	PAR		
2	EQ1001S	1	151	TONS	141	KW					2	PAR		

Card 63----- Cooling Pumps and References -----

Cool	---CHILLED WATER---	-----CONDENSER-----	---HT REC or AUX---	Switch-									
Ref	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	Full Load	over	Cold	Cooling	Misc.		
Num	Value	Units	Value	Units	Value	Units	Value	Control	Storage	Tower	Access.		
1	22.8	KW	10.33	KW								1	
2	28.7	KW	12.0	KW								2	

Card 64----- Cooling Equipment Options -----

Cool	Max	Load	Free		Cond	Cond	Cond	Cond	Cond	Cond	Cond		
Ref	CW	Shed	Evap	Cooling	Heat	Entering	Min Oper	To Ref	To Ref	To Ref	@ HW		
Num	Reset	Economizer	Precool	Type	Source	Temp	Temp	Type	Number	Temp			
1	10					85	55						
2	10					85	55						

Card 65----- Heating Load Assignment -----

Load	All Coil											
Assignment	Loads To	-Group 1-	-Group 2-	-Group 3-	-Group 4-	-Group 5-	-Group 6-	-Group 7-	-Group 8-	-Group 9-		
Reference	Heating Ref	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End	Begin End
1	1	1	3	6	10							

Card 67----- Heating Equipment Parameters -----

Heat	Equip	Number	HW Pmp	Energy				Seq	Switch	Demand				
Ref	Code	Of	Full Ld	Cap'y		Rate		Order	over	Hot	Misc.	Limit		
Number	Name	Units	Value	Units	Value	Units	Value	Units	Number	Control	Strg	Acc.	Cogen	Number
1	OILBLR	1	6.3	KW	720	MBH	900	MBH	1					
2	BLR51	1	7.1	KW	1060	MBH	1683	MBH	2					

## Card 69----- Fan Equipment Parameters -----

## System

Set	Cooling	Heating	Return	Exhaust	Auxiliary	Room	Optional
Number	Fan	Fan	Fan	Fan	Supply	Exhaust	Ventilation
1	EQ4003						
2	EQ4003						
3	EQ4003						
4	EQ4003						
5	EQ4003						
6	EQ4003						
7	EQ4003						
8	EQ4003						
9	EQ4003						
10	EQ4003						

## Card 70----- Fan Equipment KW Overrides -----

-----MAIN SYSTEM-----				--OTHER SYSTEM--				----DEMAND LIMIT PRIORITY---				
System	Cool	Heat	Ret	Exh	Aux	Room	Opt					
Set	Fan	Fan	Fan	Fan	Sup	Exh	Vent	Cool	Heat	Aux	Exh	Vent
Number	KW	KW	KW	KW	KW	KW	KW	Fan	Fan	Fan	Fan	Fan
1	4.9											
2	1.4											
3	8.5											
4	4.4											
5	3.7											
6	4.7											
7	7.8											
8	9.9											
9	2.0											
10	4.2											

## Card 71----- Base Utility Parameters -----

Base	Base	Hourly	Hourly			Equip	Demand		
Utility	Utility	Demand	Demand	Schedule	Energy	Reference	Limiting	Entering	Leaving
Number	Descrip	Value	Units	Code	Type	Number	Number	Temp	Temp
1	CHW LOADS	45.6	TONS	AVAIL	CHILL-LD	1			
2	HW LOADS	90.9	MBH	AVAIL	HOT-LD	1			
3	ALL OTHER LIGHTS	7.026	KW	OFICEL34	ELEC				

## Card 74----- Condenser / Cooling Tower Parameters -----

Cooling				Energy	Energy		Number	Percent	Low Spd	Low Spd
Tower	Tower	Capacity	Capacity	Consump	Consump	Fluid	Tower	Of	Airflow	Energy
Ref	Code	Value	Units	Value	Units	Type	Type	Cells	Low Spd	Value
1	EQ5100				KW	T-WATER	CTOWER	1		
2	EQ5100			4.7	KW	T-WATER	CTOWER	1		

```
*****
*****
**
**          TRACE    600  ANALYSIS          **
**
**          by HUITT & ZOLLARS              **
**
*****
*****
```

EEAP ENERGY STUDY - HELSTF  
WHITE SANDS - ALAMOGORDO, NEW MEXICO  
FORT WORTH CORPS OF ENGINEERS  
HUITT-ZOLLARS, INC.  
TEST CELL # 1 AND TEST CELL # 2

## EXISTING TEST CELLS 1 & 2

Weather File Code:

Location: HOLLOMAN AFB, ALAMOGORDO N.M.  
Latitude: 33.0 (deg)  
Longitude: 106.0 (deg)  
Time Zone: 7  
Elevation: 4,093 (ft)  
Barometric Pressure: 25.6 (in. Hg)

Summer Clearness Number: 1.05  
Winter Clearness Number: 1.00  
Summer Design Dry Bulb: 96 (F)  
Summer Design Wet Bulb: 68 (F)  
Winter Design Dry Bulb: 19 (F)  
Summer Ground Relectance: 0.20  
Winter Ground Relectance: 0.20

Air Density: 0.0648 (Lbm/cuft)  
Air Specific Heat: 0.2444 (Btu/lbm/F)  
Density-Specific Heat Prod: 0.9511 (Btu-min./hr/cuft/F)  
Latent Heat Factor: 4,186.5 (Btu-min./hr/cuft)  
Enthalpy Factor: 3.8908 (Lb-min./hr/cuft)

Design Simulation Period: June To November  
System Simulation Period: January To December  
Cooling Load Methodology: TETD/Time Averaging

Time/Date Program was Run: 14:49: 8 1/ 5/96  
Dataset Name: TESTCELL .TM

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
EXISTING AIRSIDE EQUIPMENT

----- SYSTEM LOAD PROFILE -----

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	4.6	0	0	-81,354	56	2,642	3,548.4	0	0	0.0	0	0
5 - 10	9.3	6	551	-162,709	36	1,708	7,096.7	0	0	0.0	0	0
10 - 15	13.9	21	1,830	-244,063	8	379	10,645.1	0	0	0.0	0	0
15 - 20	18.5	14	1,258	-325,418	0	0	14,193.4	0	0	0.0	0	0
20 - 25	23.1	9	788	-406,772	0	0	17,741.8	0	0	0.0	0	0
25 - 30	27.8	6	539	-488,127	0	0	21,290.1	0	0	0.0	0	0
30 - 35	32.4	5	395	-569,481	0	0	24,838.5	0	0	0.0	0	0
35 - 40	37.0	10	877	-650,836	0	0	28,386.8	0	0	0.0	0	0
40 - 45	41.6	6	491	-732,190	0	0	31,935.2	0	0	0.0	0	0
45 - 50	46.3	5	450	-813,545	0	0	35,483.5	0	0	0.0	0	0
50 - 55	50.9	5	481	-894,900	0	0	39,031.9	0	0	0.0	0	0
55 - 60	55.5	4	333	-976,254	0	0	42,580.2	0	0	0.0	0	0
60 - 65	60.1	5	438	-1,057,608	0	0	46,128.6	0	0	0.0	0	0
65 - 70	64.8	4	309	-1,138,963	0	0	49,676.9	0	0	0.0	0	0
70 - 75	69.4	0	20	-1,220,317	0	0	53,225.3	0	0	0.0	0	0
75 - 80	74.0	0	0	-1,301,672	0	0	56,773.6	0	0	0.0	0	0
80 - 85	78.7	0	0	-1,383,026	0	0	60,322.0	0	0	0.0	0	0
85 - 90	83.3	0	0	-1,464,381	0	0	63,870.3	0	0	0.0	0	0
90 - 95	87.9	0	0	-1,545,735	0	0	67,418.7	0	0	0.0	0	0
95 - 100	92.5	0	0	-1,627,090	0	0	70,967.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	4,031	0.0	0	0	0.0	0	8,760



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
		Lighting Systems												
0	LIGHTS													
	ELEC	40015	36142	40015	38724	40015	38724	40014	40015	38724	40015	38724	40014	471,139
	PK	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8	53.8
1	MISC LD													
	ELEC	13610	12293	13610	13171	13610	13171	13610	13610	13171	13610	13171	13610	160,248
	PK	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	33926	30643	33926	32832	33926	32832	33926	33926	32832	33926	32832	33926	399,456
	PK	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2		BASE UTILITY												
	HOTLD	676	611	676	654	676	654	676	676	654	676	654	676	7,963
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
3		BASE UTILITY												
	ELEC	4832	4366	4888	4667	4860	4723	4805	4888	4667	4860	4667	4805	57,028
	PK	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
4		BASE UTILITY												
	ELEC	11805	10662	11805	14112	11110	7392	4861	694	672	6944	11424	9027	100,509
	PK	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	----- Monthly Consumption -----												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS Chiller CH-51												
	ELEC	32292	30365	35523	38281	44990	49765	54811	52701	43132	39270	32599	32552	486,281
	PK	47.7	50.4	56.3	66.0	76.7	89.3	95.3	91.3	76.7	64.9	50.4	48.6	95.3
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-51A												
	ELEC	1648	1588	1899	2198	2798	3445	3943	3897	3348	2389	1668	1654	30,475
	PK	2.7	2.9	3.1	4.2	5.3	5.3	5.3	5.3	5.3	4.5	2.8	2.7	5.3
1	EQ5100	COOLING TOWER FANS												
	WATER	162	154	182	200	238	260	279	269	225	205	165	164	2,504
	PK	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.5
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-51												
	ELEC	20311	18346	20311	19656	20311	19656	20311	20311	19656	20311	19656	20311	239,148
	PK	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump P-60												
	ELEC	9821	8870	9821	9504	9821	9504	9821	9821	9504	9821	9504	9821	115,632
	PK	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME CND Pump P-65												
	ELEC	16591	14986	16591	16056	16591	16056	16591	16591	16056	16591	16056	16591	195,348
	PK	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS Chiller CH-52												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS Twr. Fan CT-51B												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-52												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump P-61											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5300	CONTROL PANEL & INTERLOCKS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME CND Pump P-66											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-51											
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-52											
	ELEC	1265	1142	1265	1224	1265	1224	1265	1265	1224	1265	1224	1265
	PK	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-53											
	ELEC	6398	5779	6398	6192	6398	6192	6398	6398	6192	6398	6192	6398
	PK	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-54											
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-55											
	ELEC	3050	2755	3050	2952	3050	2952	3050	3050	2952	3050	2952	3050
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-4											
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-1											
	ELEC	6473	5846	6473	6264	6473	6264	6473	6473	6264	6473	6264	6473
	PK	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-3											
	ELEC	7663	6922	7663	7416	7663	7416	7663	7663	7416	7663	7416	7663
	PK	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AH-2					
	ELEC	1562	1411	1562	1512	1562	1512	1562	1562	1512	1562	1512	1562
	PK	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME						Fan AH-5					
	ELEC	3050	2755	3050	2952	3050	2952	3050	3050	2952	3050	2952	3050
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1	BLR51	OIL FIRED HOT WATER BOILER						Boiler B-51					
	OIL	2632	1946	1706	1307	1119	1039	1074	1074	1074	1345	2068	2387
	PK	4.7	4.0	3.3	2.6	1.8	1.4	1.4	1.4	1.7	2.6	3.8	4.2
1	EQ5020	HEATING WATER CIRCULATION PUMP						HW pump P-70					
	ELEC	2009	1814	2009	1944	2009	1944	2009	2009	1944	2009	1944	2009
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
1	EQ5307	CONTROLS											
	ELEC	372	336	372	360	372	360	372	372	360	372	360	372
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1	EQ5020	HEATING WATER CIRCULATION PUMP						HW pump P-63					
	ELEC	4762	4301	4762	4608	4762	4608	4762	4762	4608	4762	4608	4762
	PK	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
2	BLR51	OIL FIRED HOT WATER BOILER						Boiler B-52					
	OIL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP						HW pump P-71					
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP						HW pump P-64					
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 2  
EXISTING AIRSIDE EQUIPMENT

----- SYSTEM LOAD PROFILE -----

ECO-A, TEST CELLS 1 & 2

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	4.6	0	0	-81,416	54	2,573	3,548.4	0	0	0.0	0	0
5 - 10	9.1	16	1,419	-162,832	35	1,647	7,096.7	0	0	0.0	0	0
10 - 15	13.7	18	1,601	-244,248	11	532	10,645.1	0	0	0.0	0	0
15 - 20	18.2	11	937	-325,664	0	0	14,193.4	0	0	0.0	0	0
20 - 25	22.8	8	743	-407,080	0	0	17,741.8	0	0	0.0	0	0
25 - 30	27.3	4	368	-488,496	0	0	21,290.1	0	0	0.0	0	0
30 - 35	31.9	7	588	-569,911	0	0	24,838.5	0	0	0.0	0	0
35 - 40	36.4	9	821	-651,327	0	0	28,386.8	0	0	0.0	0	0
40 - 45	41.0	5	433	-732,743	0	0	31,935.2	0	0	0.0	0	0
45 - 50	45.6	6	514	-814,159	0	0	35,483.5	0	0	0.0	0	0
50 - 55	50.1	5	415	-895,575	0	0	39,031.9	0	0	0.0	0	0
55 - 60	54.7	3	223	-976,991	0	0	42,580.2	0	0	0.0	0	0
60 - 65	59.2	5	449	-1,058,407	0	0	46,128.6	0	0	0.0	0	0
65 - 70	63.8	3	249	-1,139,823	0	0	49,676.9	0	0	0.0	0	0
70 - 75	68.3	0	0	-1,221,239	0	0	53,225.3	0	0	0.0	0	0
75 - 80	72.9	0	0	-1,302,655	0	0	56,773.6	0	0	0.0	0	0
80 - 85	77.5	0	0	-1,384,071	0	0	60,322.0	0	0	0.0	0	0
85 - 90	82.0	0	0	-1,465,487	0	0	63,870.3	0	0	0.0	0	0
90 - 95	86.6	0	0	-1,546,903	0	0	67,418.7	0	0	0.0	0	0
95 - 100	91.1	0	0	-1,628,319	0	0	70,967.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	4,008	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS	Lighting Systems												
	ELEC	32278	29154	32278	31236	32278	31236	32278	32278	31236	32278	31236	32278	380,044
	PK	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
1	MISC LD													
	ELEC	13610	12293	13610	13171	13610	13171	13610	13610	13171	13610	13171	13610	160,248
	PK	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	33926	30643	33926	32832	33926	32832	33926	33926	32832	33926	32832	33926	399,456
	PK	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2		BASE UTILITY												
	HOTLD	676	611	676	654	676	654	676	676	654	676	654	676	7,963
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
3		BASE UTILITY												
	ELEC	3863	3489	3907	3731	3885	3775	3840	3907	3731	3885	3731	3840	45,583
	PK	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
4		BASE UTILITY												
	ELEC	11805	10662	11805	14112	11110	7392	4861	694	672	6944	11424	9027	100,509
	PK	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS Chiller CH-51												
	ELEC	31361	29397	34464	37307	43942	48575	53438	51390	42057	38329	31407	31547	473,214
	PK	46.6	49.2	54.7	64.5	74.9	87.3	93.5	89.1	74.8	63.3	48.9	47.4	93.5
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-51A												
	ELEC	1550	1491	1802	2126	2742	3423	3935	3890	3323	2324	1547	1548	29,700
	PK	2.6	2.8	3.0	4.2	5.3	5.3	5.3	5.3	5.3	4.4	2.7	2.6	5.3
1	EQ5100	COOLING TOWER FANS												
	WATER	156	148	176	194	232	253	273	263	219	199	158	157	2,428
	PK	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.5
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-51												
	ELEC	20311	18346	20311	19656	20311	19656	20311	20311	19656	20311	19656	20311	239,148
	PK	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump P-60												
	ELEC	9821	8870	9821	9504	9821	9504	9821	9821	9504	9821	9504	9821	115,632
	PK	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME CND Pump P-65												
	ELEC	16591	14986	16591	16056	16591	16056	16591	16591	16056	16591	16056	16591	195,348
	PK	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-51												
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646	42,924
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-52												
	ELEC	1265	1142	1265	1224	1265	1224	1265	1265	1224	1265	1224	1265	14,892
	PK	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-53												
	ELEC	6398	5779	6398	6192	6398	6192	6398	6398	6192	6398	6192	6398	75,336
	PK	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-54												
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274	38,544
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-55												
	ELEC	3050	2755	3050	2952	3050	2952	3050	3050	2952	3050	2952	3050	35,916
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-4												
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646	42,924
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-1												
	ELEC	6473	5846	6473	6264	6473	6264	6473	6473	6264	6473	6264	6473	76,212
	PK	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-3												
	ELEC	7663	6922	7663	7416	7663	7416	7663	7663	7416	7663	7416	7663	90,228
	PK	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-2											
	ELEC	1562	1411	1562	1512	1562	1512	1562	1562	1512	1562	1512	1562
	PK	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-5											
	ELEC	3050	2755	3050	2952	3050	2952	3050	3050	2952	3050	2952	3050
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1	BLR51	OIL FIRED HOT WATER BOILER Boiler B-51											
	OIL	2732	1989	1725	1317	1123	1039	1074	1074	1077	1356	2112	2466
	PK	5.1	4.1	3.3	2.6	1.8	1.4	1.4	1.4	1.7	2.6	4.0	4.4
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-70											
	ELEC	2009	1814	2009	1944	2009	1944	2009	2009	1944	2009	1944	2009
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
1	EQ5307	CONTROLS											
	ELEC	372	336	372	360	372	360	372	372	360	372	360	372
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-63											
	ELEC	4762	4301	4762	4608	4762	4608	4762	4762	4608	4762	4608	4762
	PK	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
2	BLR51	OIL FIRED HOT WATER BOILER											
	OIL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 3  
EXISTING AIRSIDE EQUIPMENT

----- SYSTEM LOAD PROFILE -----

ECO-B, TEST CELLS 1 & 2

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	4.6	0	0	-81,416	55	2,717	3,548.4	0	0	0.0	0	0
5 - 10	9.1	19	1,625	-162,832	30	1,499	7,096.7	0	0	0.0	0	0
10 - 15	13.7	17	1,512	-244,248	14	699	10,645.1	0	0	0.0	0	0
15 - 20	18.2	10	889	-325,664	0	0	14,193.4	0	0	0.0	0	0
20 - 25	22.8	8	684	-407,080	0	0	17,741.8	0	0	0.0	0	0
25 - 30	27.3	5	478	-488,496	0	0	21,290.1	0	0	0.0	0	0
30 - 35	31.9	6	536	-569,911	0	0	24,838.5	0	0	0.0	0	0
35 - 40	36.4	9	832	-651,327	0	0	28,386.8	0	0	0.0	0	0
40 - 45	41.0	5	403	-732,743	0	0	31,935.2	0	0	0.0	0	0
45 - 50	45.6	6	503	-814,159	0	0	35,483.5	0	0	0.0	0	0
50 - 55	50.1	5	439	-895,575	0	0	39,031.9	0	0	0.0	0	0
55 - 60	54.7	3	276	-976,991	0	0	42,580.2	0	0	0.0	0	0
60 - 65	59.2	5	437	-1,058,407	0	0	46,128.6	0	0	0.0	0	0
65 - 70	63.8	2	146	-1,139,823	0	0	49,676.9	0	0	0.0	0	0
70 - 75	68.3	0	0	-1,221,239	0	0	53,225.3	0	0	0.0	0	0
75 - 80	72.9	0	0	-1,302,655	0	0	56,773.6	0	0	0.0	0	0
80 - 85	77.5	0	0	-1,384,071	0	0	60,322.0	0	0	0.0	0	0
85 - 90	82.0	0	0	-1,465,487	0	0	63,870.3	0	0	0.0	0	0
90 - 95	86.6	0	0	-1,546,903	0	0	67,418.7	0	0	0.0	0	0
95 - 100	91.1	0	0	-1,628,319	0	0	70,967.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	3,845	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
Lighting Systems														
0	LIGHTS													
	ELEC	30290	27359	30302	29311	30296	29323	30284	30302	29311	30296	29311	30284	356,670
	PK	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
1	MISC LD													
	ELEC	13610	12293	13610	13171	13610	13171	13610	13610	13171	13610	13171	13610	160,248
	PK	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY												
	CHILLD	33926	30643	33926	32832	33926	32832	33926	33926	32832	33926	32832	33926	399,456
	PK	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2		BASE UTILITY												
	HOTLD	676	611	676	654	676	654	676	676	654	676	654	676	7,963
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
3		BASE UTILITY												
	ELEC	1727	1561	1802	1660	1765	1734	1690	1802	1660	1765	1660	1690	20,516
	PK	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
4		BASE UTILITY												
	ELEC	11805	10662	11805	14112	11110	7392	4861	694	672	6944	11424	9027	100,509
	PK	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4	22.4

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----														
Ref	Equip	----- Monthly Consumption -----												
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total
1	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TQNS Chiller CH-51												
	ELEC	31196	29224	34226	37021	43606	48189	52975	50929	41710	38037	31219	31377	469,708
	PK	46.6	49.2	54.7	64.5	74.9	87.3	93.5	89.1	74.8	63.3	48.8	47.4	93.5
1	EQ5100	Tw. Fan CT-51A												
	ELEC	1532	1473	1779	2105	2725	3415	3934	3888	3308	2303	1527	1530	29,520
	PK	2.6	2.8	3.0	4.2	5.3	5.3	5.3	5.3	5.3	4.4	2.7	2.6	5.3
1	EQ5100	COOLING TOWER FANS												
	WATER	155	147	174	193	230	251	270	260	217	198	157	156	2,408
	PK	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.5
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-51												
	ELEC	20311	18346	20311	19656	20311	19656	20311	20311	19656	20311	19656	20311	239,148
	PK	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump P-60												
	ELEC	9821	8870	9821	9504	9821	9504	9821	9821	9504	9821	9504	9821	115,632
	PK	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME CND Pump P-65												
	ELEC	16591	14986	16591	16056	16591	16056	16591	16591	16056	16591	16056	16591	195,348
	PK	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFICI.)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-51												
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646	42,924
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-52												
	ELEC	1265	1142	1265	1224	1265	1224	1265	1265	1224	1265	1224	1265	14,892
	PK	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-53												
	ELEC	6398	5779	6398	6192	6398	6192	6398	6398	6192	6398	6192	6398	75,336
	PK	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-54												
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274	38,544
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-55												
	ELEC	3050	2755	3050	2952	3050	2952	3050	3050	2952	3050	2952	3050	35,916
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-4												
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646	42,924
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-1												
	ELEC	6473	5846	6473	6264	6473	6264	6473	6473	6264	6473	6264	6473	76,212
	PK	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-3												
	ELEC	7663	6922	7663	7416	7663	7416	7663	7663	7416	7663	7416	7663	90,228
	PK	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
EXISTING PRIMARY EQUIPMENT

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-2											
	ELEC	1562	1411	1562	1512	1562	1512	1562	1562	1512	1562	1512	1562
	PK	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
													18,396
													2.1
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-5											
	ELEC	3050	2755	3050	2952	3050	2952	3050	3050	2952	3050	2952	3050
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
													35,916
													4.1
1	BLR51	OIL FIRED HOT WATER BOILER Boiler B-51											
	OIL	2784	2027	1752	1330	1128	1039	1074	1074	1082	1370	2153	2518
	PK	5.1	4.2	3.4	2.7	1.8	1.4	1.4	1.4	1.8	2.6	4.0	4.4
													19,331
													5.1
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-70											
	ELEC	2009	1814	2009	1944	2009	1944	2009	2009	1944	2009	1944	2009
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
													23,652
													2.7
1	EQ5307	CONTROLS											
	ELEC	372	336	372	360	372	360	372	372	360	372	360	372
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
													4,380
													0.5
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-63											
	ELEC	4762	4301	4762	4608	4762	4608	4762	4762	4608	4762	4608	4762
	PK	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
													56,064
													6.4
2	BLR51	OIL FIRED HOT WATER BOILER											
	OIL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
													0
													0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
													0
													0.0
2	EQ5307	CONTROLS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
													0
													0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
													0
													0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 4  
AIRSIDE EQ WITH NEW CONTROLS

----- SYSTEM LOAD PROFILE -----  
**ECO-C, TEST CELLS 1 & 2**

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	2.8	0	0	-43,973	99	2,799	3,548.4	0	0	0.0	0	0
5 - 10	5.5	10	884	-87,947	1	42	7,096.7	0	0	0.0	0	0
10 - 15	8.3	28	2,466	-131,920	0	0	10,645.1	0	0	0.0	0	0
15 - 20	11.1	8	661	-175,893	0	0	14,193.4	0	0	0.0	0	0
20 - 25	13.8	4	316	-219,867	0	0	17,741.8	0	0	0.0	0	0
25 - 30	16.6	4	312	-263,840	0	0	21,290.1	0	0	0.0	0	0
30 - 35	19.4	1	127	-307,813	0	0	24,838.5	0	0	0.0	0	0
35 - 40	22.1	2	139	-351,787	0	0	28,386.8	0	0	0.0	0	0
40 - 45	24.9	1	131	-395,760	0	0	31,935.2	0	0	0.0	0	0
45 - 50	27.6	1	88	-439,733	0	0	35,483.5	0	0	0.0	0	0
50 - 55	30.4	6	527	-483,707	0	0	39,031.9	0	0	0.0	0	0
55 - 60	33.2	4	347	-527,680	0	0	42,580.2	0	0	0.0	0	0
60 - 65	35.9	13	1,132	-571,653	0	0	46,128.6	0	0	0.0	0	0
65 - 70	38.7	7	651	-615,627	0	0	49,676.9	0	0	0.0	0	0
70 - 75	41.5	9	784	-659,600	0	0	53,225.3	0	0	0.0	0	0
75 - 80	44.2	0	0	-703,573	0	0	56,773.6	0	0	0.0	0	0
80 - 85	47.0	2	175	-747,547	0	0	60,322.0	0	0	0.0	0	0
85 - 90	49.8	0	20	-791,520	0	0	63,870.3	0	0	0.0	0	0
90 - 95	52.5	0	0	-835,493	0	0	67,418.7	0	0	0.0	0	0
95 - 100	55.3	0	0	-879,467	0	0	70,967.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	5,919	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
PRIMARY EQ WITH NEW CONTROLS

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
0	LIGHTS	Lighting Systems											
	ELEC	30290	27359	30302	29311	30296	29323	30284	30302	29311	30296	29311	30284
	PK	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
1	MISC LD												
	ELEC	13610	12293	13610	13171	13610	13171	13610	13610	13171	13610	13171	13610
	PK	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6
2	MISC LD												
	GAS	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD												
	OIL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD												
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD												
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD												
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1		BASE UTILITY											
	CHILLD	33926	30643	33926	32832	33926	32832	33926	33926	32832	33926	32832	33926
	PK	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2		BASE UTILITY											
	HOTLD	676	611	676	654	676	654	676	676	654	676	654	676
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
3		BASE UTILITY											
	ELEC	1727	1561	1802	1660	1765	1734	1690	1802	1660	1765	1660	1690
	PK	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
1	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS Chiller CH-51											
	ELEC	26842	24579	28464	30850	36612	41381	45383	44838	36881	31884	26274	26863
	PK	37.7	38.7	49.6	56.2	63.9	71.5	76.0	74.3	66.1	56.2	38.4	38.0



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
PRIMARY EQ WITH NEW CONTROLS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Twr. Fan CT-51A														
1	EQ5100	COOLING TOWER FANS												
	ELEC	3114	2861	3393	3466	3851	3816	3943	3943	3816	3639	3160	3142	42,143
	PK	4.5	4.7	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.0	4.6	5.3
1	EQ5100	COOLING TOWER FANS												
	WATER	147	135	158	176	209	228	241	239	203	180	144	147	2,208
	PK	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.4
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-51												
	ELEC	20311	18346	20311	19656	20311	19656	20311	20311	19656	20311	19656	20311	239,148
	PK	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
1	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.) CND Pump P-60												
	ELEC	9821	8870	9821	9504	9821	9504	9821	9821	9504	9821	9504	9821	115,632
	PK	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME CND Pump P-65												
	ELEC	16591	14986	16591	16056	16591	16056	16591	16591	16056	16591	16056	16591	195,348
	PK	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
PRIMARY EQ WITH NEW CONTROLS

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
2	EQ5300	CONTROL PANEL & INTERLOCKS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-51											
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-52											
	ELEC	1265	1142	1265	1224	1265	1224	1265	1265	1224	1265	1224	1265
	PK	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-53											
	ELEC	6398	5779	6398	6192	6398	6192	6398	6398	6192	6398	6192	6398
	PK	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-54											
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-55											
	ELEC	3050	2755	3050	2952	3050	2952	3050	3050	2952	3050	2952	3050
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-4											
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-1											
	ELEC	6473	5846	6473	6264	6473	6264	6473	6473	6264	6473	6264	6473
	PK	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7	8.7
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-3											
	ELEC	7663	6922	7663	7416	7663	7416	7663	7663	7416	7663	7416	7663
	PK	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-2											
	ELEC	1562	1411	1562	1512	1562	1512	1562	1562	1512	1562	1512	1562
	PK	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 4  
PRIMARY EQ WITH NEW CONTROLS

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-5											
	ELEC	3050	2755	3050	2952	3050	2952	3050	3050	2952	3050	2952	3050
	PK	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
1	BLR51	OIL FIRED HOT WATER BOILER Boiler B-51											
	OIL	1386	1172	1197	1093	1081	1039	1074	1074	1048	1133	1262	1355
	PK	2.2	2.0	2.0	2.0	1.7	1.4	1.4	1.4	1.7	2.0	2.0	2.1
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-70											
	ELEC	2009	1814	2009	1944	2009	1944	2009	2009	1944	2009	1944	2009
	PK	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
1	EQ5307	CONTROLS											
	ELEC	372	336	372	360	372	360	372	372	360	372	360	372
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-63											
	ELEC	4762	4301	4762	4608	4762	4608	4762	4762	4608	4762	4608	4762
	PK	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
2	BLR51	OIL FIRED HOT WATER BOILER											
	OIL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
AIRSIDE EQ WITH NEW MOTORS

----- SYSTEM LOAD PROFILE -----

ECO-E, TEST CELLS 1 & 2

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	2.8	0	0	-43,973	99	2,799	3,548.4	0	0	0.0	0	0
5 - 10	5.5	10	884	-87,947	1	42	7,096.7	0	0	0.0	0	0
10 - 15	8.3	28	2,466	-131,920	0	0	10,645.1	0	0	0.0	0	0
15 - 20	11.1	8	661	-175,893	0	0	14,193.4	0	0	0.0	0	0
20 - 25	13.8	4	316	-219,867	0	0	17,741.8	0	0	0.0	0	0
25 - 30	16.6	4	312	-263,840	0	0	21,290.1	0	0	0.0	0	0
30 - 35	19.4	1	127	-307,813	0	0	24,838.5	0	0	0.0	0	0
35 - 40	22.1	2	139	-351,787	0	0	28,386.8	0	0	0.0	0	0
40 - 45	24.9	1	131	-395,760	0	0	31,935.2	0	0	0.0	0	0
45 - 50	27.6	1	88	-439,733	0	0	35,483.5	0	0	0.0	0	0
50 - 55	30.4	6	527	-483,707	0	0	39,031.9	0	0	0.0	0	0
55 - 60	33.2	4	347	-527,680	0	0	42,580.2	0	0	0.0	0	0
60 - 65	35.9	13	1,132	-571,653	0	0	46,128.6	0	0	0.0	0	0
65 - 70	38.7	7	651	-615,627	0	0	49,676.9	0	0	0.0	0	0
70 - 75	41.5	9	784	-659,600	0	0	53,225.3	0	0	0.0	0	0
75 - 80	44.2	0	0	-703,573	0	0	56,773.6	0	0	0.0	0	0
80 - 85	47.0	2	175	-747,547	0	0	60,322.0	0	0	0.0	0	0
85 - 90	49.8	0	20	-791,520	0	0	63,870.3	0	0	0.0	0	0
90 - 95	52.5	0	0	-835,493	0	0	67,418.7	0	0	0.0	0	0
95 - 100	55.3	0	0	-879,467	0	0	70,967.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	5,919	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
PRIMARY EQ WITH NEW MOTORS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
0	LIGHTS	Lighting Systems												
	ELEC	30290	27359	30302	29311	30296	29323	30284	30302	29311	30296	29311	30284	356,670
	PK	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
1	MISC LD													
	ELEC	13610	12293	13610	13171	13610	13171	13610	13610	13171	13610	13171	13610	160,248
	PK	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	BASE UTILITY													
	CHILLD	33926	30643	33926	32832	33926	32832	33926	33926	32832	33926	32832	33926	399,456
	PK	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2	BASE UTILITY													
	HOTLD	676	611	676	654	676	654	676	676	654	676	654	676	7,963
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
3	BASE UTILITY													
	ELEC	1727	1561	1802	1660	1765	1734	1690	1802	1660	1765	1660	1690	20,516
	PK	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
1	2-STG CENTRIFUGAL CHILLER <550 TONS Chiller CH-51													
	ELEC	26842	24579	28464	30850	36612	41381	45383	44838	36881	31884	26274	26863	400,851
	PK	37.7	38.7	49.6	56.2	63.9	71.5	76.0	74.3	66.1	56.2	38.4	38.0	76.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
PRIMARY EQ WITH NEW MOTORS

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ5100	Tw. Fan CT-51A											
	ELEC	COOLING TOWER FANS											
	PK	2761	2537	3008	3073	3415	3384	3497	3497	3384	3227	2802	2786
		4.0	4.2	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.4	4.1
1	EQ5100	COOLING TOWER FANS											
	WATER	147	135	158	176	209	228	241	239	203	180	144	147
	PK	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2
1	EQ5001	CHW Pump P-51											
	ELEC	CHILLED WATER PUMP - CONSTANT VOLUME											
	PK	19939	18010	19939	19296	19939	19296	19939	19939	19296	19939	19296	19939
		26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8
1	EQ5010	CND Pump P-60											
	ELEC	CONDENSER WATER PUMP-CV(HIGH EFFIC.)											
	PK	9672	8736	9672	9360	9672	9360	9672	9672	9360	9672	9360	9672
		13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
1	EQ5300	CONTROL PANEL & INTERLOCKS											
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
1	EQ5013	CND Pump P-65											
	ELEC	WATER CIRCULATING PUMP - CONSTANT VOLUME											
	PK	16070	14515	16070	15552	16070	15552	16070	16070	15552	16070	15552	16070
		21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS											
	WATER	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
PRIMARY EQ WITH NEW MOTORS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5013	WATER CIRCULATING PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-51												
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646	42,924
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-52												
	ELEC	1042	941	1042	1008	1042	1008	1042	1042	1008	1042	1008	1042	12,264
	PK	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-53												
	ELEC	6324	5712	6324	6120	6324	6120	6324	6324	6120	6324	6120	6324	74,460
	PK	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-54												
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274	38,544
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-55												
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753	32,412
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-4												
	ELEC	3497	3158	3497	3384	3497	3384	3497	3497	3384	3497	3384	3497	41,172
	PK	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-1												
	ELEC	5803	5242	5803	5616	5803	5616	5803	5803	5616	5803	5616	5803	68,328
	PK	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-3												
	ELEC	7366	6653	7366	7128	7366	7128	7366	7366	7128	7366	7128	7366	86,724
	PK	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-2												
	ELEC	1488	1344	1488	1440	1488	1440	1488	1488	1440	1488	1440	1488	17,520
	PK	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 1  
PRIMARY EQ WITH NEW MOTORS

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-5												
	ELEC	3125	2822	3125	3024	3125	3024	3125	3125	3024	3125	3024	3125	36,792
	PK	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
1	BLR51	OIL FIRED HOT WATER BOILER Boiler B-51												
	OIL	1386	1172	1197	1093	1081	1039	1074	1074	1048	1133	1262	1355	13,913
	PK	2.2	2.0	2.0	2.0	1.7	1.4	1.4	1.4	1.7	2.0	2.0	2.1	2.2
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-70												
	ELEC	1711	1546	1711	1656	1711	1656	1711	1711	1656	1711	1656	1711	20,148
	PK	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
1	EQ5307	CONTROLS												
	ELEC	372	336	372	360	372	360	372	372	360	372	360	372	4,380
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-63												
	ELEC	4687	4234	4687	4536	4687	4536	4687	4687	4536	4687	4536	4687	55,188
	PK	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
2	BLR51	OIL FIRED HOT WATER BOILER												
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
AIRSIDE EQ WITH NEW MOTORS

----- SYSTEM LOAD PROFILE -----  
**ECO-G, TEST CELLS 1 & 2**

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	2.8	0	0	-43,973	99	2,799	3,548.4	0	0	0.0	0	0
5 - 10	5.5	10	884	-87,947	1	42	7,096.7	0	0	0.0	0	0
10 - 15	8.3	28	2,466	-131,920	0	0	10,645.1	0	0	0.0	0	0
15 - 20	11.1	8	661	-175,893	0	0	14,193.4	0	0	0.0	0	0
20 - 25	13.8	4	316	-219,867	0	0	17,741.8	0	0	0.0	0	0
25 - 30	16.6	4	312	-263,840	0	0	21,290.1	0	0	0.0	0	0
30 - 35	19.4	1	127	-307,813	0	0	24,838.5	0	0	0.0	0	0
35 - 40	22.1	2	139	-351,787	0	0	28,386.8	0	0	0.0	0	0
40 - 45	24.9	1	131	-395,760	0	0	31,935.2	0	0	0.0	0	0
45 - 50	27.6	1	88	-439,733	0	0	35,483.5	0	0	0.0	0	0
50 - 55	30.4	6	527	-483,707	0	0	39,031.9	0	0	0.0	0	0
55 - 60	33.2	4	347	-527,680	0	0	42,580.2	0	0	0.0	0	0
60 - 65	35.9	13	1,132	-571,653	0	0	46,128.6	0	0	0.0	0	0
65 - 70	38.7	7	651	-615,627	0	0	49,676.9	0	0	0.0	0	0
70 - 75	41.5	9	784	-659,600	0	0	53,225.3	0	0	0.0	0	0
75 - 80	44.2	0	0	-703,573	0	0	56,773.6	0	0	0.0	0	0
80 - 85	47.0	2	175	-747,547	0	0	60,322.0	0	0	0.0	0	0
85 - 90	49.8	0	20	-791,520	0	0	63,870.3	0	0	0.0	0	0
90 - 95	52.5	0	0	-835,493	0	0	67,418.7	0	0	0.0	0	0
95 - 100	55.3	0	0	-879,467	0	0	70,967.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	5,919	0.0	0	0	0.0	0	8,760

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
NEW CHW & CND SYSTEM

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption													
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Total	
0	LIGHTS	Lighting Systems													
	ELEC	30290	27359	30302	29311	30296	29323	30284	30302	29311	30296	29311	30284	356,670	
	PK	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	
1	MISC LD														
	ELEC	13610	12293	13610	13171	13610	13171	13610	13610	13171	13610	13171	13610	160,248	
	PK	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	
2	MISC LD														
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
3	MISC LD														
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
4	MISC LD														
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
5	MISC LD														
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
6	MISC LD														
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0	
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
1	BASE UTILITY														
	CHILLD	33926	30643	33926	32832	33926	32832	33926	33926	32832	33926	32832	33926	399,456	
	PK	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	
2	BASE UTILITY														
	HOTLD	676	611	676	654	676	654	676	676	654	676	654	676	7,963	
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
3	BASE UTILITY														
	ELEC	1727	1561	1802	1660	1765	1734	1690	1802	1660	1765	1660	1690	20,516	
	PK	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
1	YORK CENT. R-123 CHILLER      New Chiller CH-51														
	ELEC	29154	26644	30638	32520	36738	35005	35282	34655	32492	33381	28491	29173	384,173	
	PK	40.7	41.6	50.9	54.5	57.8	59.0	56.3	55.1	56.3	54.0	41.3	41.0	59.0	

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
NEW CHW & CND SYSTEM

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
Tw. Fan CT-51A														
1	EQ5100	COOLING TOWER FANS												
	ELEC	2663	2449	2922	3018	3387	3384	3497	3497	3384	3178	2714	2690	36,782
	PK	3.8	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.3	3.9	4.7
1	EQ5100	COOLING TOWER FANS												
	WATER	149	137	160	178	209	223	232	230	199	182	146	149	2,193
	PK	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.4
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	16963	15322	16963	16416	16963	16416	16963	16963	16416	16963	16416	16963	199,728
	PK	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8
1	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.)												
	ELEC	7686	6942	7686	7438	7686	7438	7686	7686	7438	7686	7438	7686	90,491
	PK	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
1	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744	8,760
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS												
	WATER	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5300	CONTROL PANEL & INTERLOCKS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
NEW CHW & CND SYSTEM

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-51											
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-52											
	ELEC	1042	941	1042	1008	1042	1008	1042	1042	1008	1042	1008	1042
	PK	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-53											
	ELEC	6324	5712	6324	6120	6324	6120	6324	6324	6120	6324	6120	6324
	PK	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-54											
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-55											
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-4											
	ELEC	3497	3158	3497	3384	3497	3384	3497	3497	3384	3497	3384	3497
	PK	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-1											
	ELEC	5803	5242	5803	5616	5803	5616	5803	5803	5616	5803	5616	5803
	PK	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-3											
	ELEC	7366	6653	7366	7128	7366	7128	7366	7366	7128	7366	7128	7366
	PK	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-2											
	ELEC	1488	1344	1488	1440	1488	1440	1488	1488	1440	1488	1440	1488
	PK	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-5											
	ELEC	3125	2822	3125	3024	3125	3024	3125	3125	3024	3125	3024	3125
	PK	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
1	BLR51	OIL FIRED HOT WATER BOILER Boiler B-51											
	OIL	1386	1172	1197	1093	1081	1039	1074	1074	1048	1133	1262	1355
	PK	2.2	2.0	2.0	2.0	1.7	1.4	1.4	1.4	1.7	2.0	2.0	2.1

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 2  
NEW CHW & CND SYSTEM

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
HW pump P-70														
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	1711	1546	1711	1656	1711	1656	1711	1711	1656	1711	1656	1711	20,148
	PK	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
1	EQ5307	CONTROLS												
	ELEC	372	336	372	360	372	360	372	372	360	372	360	372	4,380
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
HW pump P-63														
1	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	4687	4234	4687	4536	4687	4536	4687	4687	4536	4687	4536	4687	55,188
	PK	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
2	BLR51	OIL FIRED HOT WATER BOILER												
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP												
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

SYSTEM TOTALS LOAD PROFILE - ALTERNATIVE 1  
AIRSIDE EQ WITH NEW MOTORS

----- SYSTEM LOAD PROFILE -----

ECO-H, TEST CELLS 1 & 2

System Totals

Percent Design Load	---- Cooling Load ----			----- Heating Load -----			---- Cooling Airflow ----			---- Heating Airflow ----		
	Cap. (Ton)	Hours (%)	Hours	Capacity (Btuh)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours	Cap. (Cfm)	Hours (%)	Hours
0 - 5	2.8	0	0	-43,973	99	2,799	3,548.4	0	0	0.0	0	0
5 - 10	5.5	10	884	-87,947	1	42	7,096.7	0	0	0.0	0	0
10 - 15	8.3	28	2,466	-131,920	0	0	10,645.1	0	0	0.0	0	0
15 - 20	11.1	8	661	-175,893	0	0	14,193.4	0	0	0.0	0	0
20 - 25	13.8	4	316	-219,867	0	0	17,741.8	0	0	0.0	0	0
25 - 30	16.6	4	312	-263,840	0	0	21,290.1	0	0	0.0	0	0
30 - 35	19.4	1	127	-307,813	0	0	24,838.5	0	0	0.0	0	0
35 - 40	22.1	2	139	-351,787	0	0	28,386.8	0	0	0.0	0	0
40 - 45	24.9	1	131	-395,760	0	0	31,935.2	0	0	0.0	0	0
45 - 50	27.6	1	88	-439,733	0	0	35,483.5	0	0	0.0	0	0
50 - 55	30.4	6	527	-483,707	0	0	39,031.9	0	0	0.0	0	0
55 - 60	33.2	4	347	-527,680	0	0	42,580.2	0	0	0.0	0	0
60 - 65	35.9	13	1,132	-571,653	0	0	46,128.6	0	0	0.0	0	0
65 - 70	38.7	7	651	-615,627	0	0	49,676.9	0	0	0.0	0	0
70 - 75	41.5	9	784	-659,600	0	0	53,225.3	0	0	0.0	0	0
75 - 80	44.2	0	0	-703,573	0	0	56,773.6	0	0	0.0	0	0
80 - 85	47.0	2	175	-747,547	0	0	60,322.0	0	0	0.0	0	0
85 - 90	49.8	0	20	-791,520	0	0	63,870.3	0	0	0.0	0	0
90 - 95	52.5	0	0	-835,493	0	0	67,418.7	0	0	0.0	0	0
95 - 100	55.3	0	0	-879,467	0	0	70,967.0	100	8,760	0.0	0	0
Hours Off	0.0	0	0	0	0	5,919	0.0	0	0	0.0	0	8,760

## EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3

## NEW HW SYSTEM

## ----- EQUIPMENT ENERGY CONSUMPTION -----

Ref Num	Equip Code	Monthly Consumption												Total
		Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
		Lighting Systems												
0	LIGHTS													
	ELEC	30290	27359	30302	29311	30296	29323	30284	30302	29311	30296	29311	30284	356,670
	PK	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4	43.4
1	MISC LD													
	ELEC	13610	12293	13610	13171	13610	13171	13610	13610	13171	13610	13171	13610	160,248
	PK	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6	36.6
2	MISC LD													
	GAS	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	MISC LD													
	OIL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	MISC LD													
	P STEAM	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	MISC LD													
	P HOTH2O	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	MISC LD													
	P CHILL	0	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	BASE UTILITY													
	CHILLD	33926	30643	33926	32832	33926	32832	33926	33926	32832	33926	32832	33926	399,456
	PK	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
2	BASE UTILITY													
	HOTLD	676	611	676	654	676	654	676	676	654	676	654	676	7,963
	PK	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
3	BASE UTILITY													
	ELEC	1727	1561	1802	1660	1765	1734	1690	1802	1660	1765	1660	1690	20,516
	PK	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
1	YORK CENT. R-123 CHILLER													
	New Chiller CH-51													
	ELEC	29154	26644	30638	32520	36738	35005	35282	34655	32492	33381	28491	29173	384,173
	PK	40.7	41.6	50.9	54.5	57.8	59.0	56.3	55.1	56.3	54.0	41.3	41.0	59.0

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
NEW HW SYSTEM

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	Monthly Consumption											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ5100	COOLING TOWER FANS Twr. Fan CT-51A											
	ELEC	2663	2449	2922	3018	3387	3384	3497	3497	3384	3178	2714	2690
	PK	3.8	4.0	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.3	3.9
1	EQ5100	COOLING TOWER FANS											
	WATER	149	137	160	178	209	223	232	230	199	182	146	149
	PK	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2
1	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME CHW Pump P-51											
	ELEC	16963	15322	16963	16416	16963	16416	16963	16963	16416	16963	16416	16963
	PK	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8	22.8
1	EQ5011	CONDENSER WATER PUMP-CV(MEDIUM EFFIC.) New CND Pump P-66											
	ELEC	7686	6942	7686	7438	7686	7438	7686	7686	7438	7686	7438	7686
	PK	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
1	EQ5300	CONTROL PANEL & INTERLOCKS											
	ELEC	744	672	744	720	744	720	744	744	720	744	720	744
	PK	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2	EQ1001S	2-STG CENTRIFUGAL CHILLER <550 TONS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5100	COOLING TOWER FANS											
	WATER	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5001	CHILLED WATER PUMP - CONSTANT VOLUME											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5010	CONDENSER WATER PUMP-CV(HIGH EFFIC.)											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5300	CONTROL PANEL & INTERLOCKS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
NEW HW SYSTEM

----- EQUIPMENT ENERGY CONSUMPTION -----

Ref	Equip	Monthly Consumption												Total
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	
1	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-51												
	ELEC	3646	3293	3646	3528	3646	3528	3646	3646	3528	3646	3528	3646	42,924
	PK	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9
2	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-52												
	ELEC	1042	941	1042	1008	1042	1008	1042	1042	1008	1042	1008	1042	12,264
	PK	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
3	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-53												
	ELEC	6324	5712	6324	6120	6324	6120	6324	6324	6120	6324	6120	6324	74,460
	PK	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
4	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-54												
	ELEC	3274	2957	3274	3168	3274	3168	3274	3274	3168	3274	3168	3274	38,544
	PK	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
5	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-55												
	ELEC	2753	2486	2753	2664	2753	2664	2753	2753	2664	2753	2664	2753	32,412
	PK	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
6	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-4												
	ELEC	3497	3158	3497	3384	3497	3384	3497	3497	3384	3497	3384	3497	41,172
	PK	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7
7	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-1												
	ELEC	5803	5242	5803	5616	5803	5616	5803	5803	5616	5803	5616	5803	68,328
	PK	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8
8	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-3												
	ELEC	7366	6653	7366	7128	7366	7128	7366	7366	7128	7366	7128	7366	86,724
	PK	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9	9.9
9	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-2												
	ELEC	1488	1344	1488	1440	1488	1440	1488	1488	1440	1488	1440	1488	17,520
	PK	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
10	EQ4003	FC CENTRIFUGAL - CONSTANT VOLUME Fan AH-5												
	ELEC	3125	2822	3125	3024	3125	3024	3125	3125	3024	3125	3024	3125	36,792
	PK	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
1	OILBLR	OIL FIRED HOT WATER BOILER New Boiler B-51												
	OIL	1091	923	942	860	851	818	845	845	825	892	994	1067	10,954
	PK	1.7	1.6	1.6	1.6	1.3	1.1	1.1	1.1	1.4	1.6	1.6	1.6	1.7

EQUIPMENT ENERGY CONSUMPTION - ALTERNATIVE 3  
NEW HW SYSTEM

----- EQUIPMENT ENERGY CONSUMPTION -----													
Ref	Equip	----- Monthly Consumption -----											
Num	Code	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
1	EQ5020	HEATING WATER CIRCULATION PUMP HW pump P-63											
	ELEC	4687	4234	4687	4536	4687	4536	4687	4687	4536	4687	4536	4687
	PK	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
1	EQ5307	CONTROLS											
	ELEC	372	336	372	360	372	360	372	372	360	372	360	372
	PK	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
2	BLR51	OIL FIRED HOT WATER BOILER											
	OIL	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5020	HEATING WATER CIRCULATION PUMP											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	EQ5307	CONTROLS											
	ELEC	0	0	0	0	0	0	0	0	0	0	0	0
	PK	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

55,188  
6.3

## Utility Description Reference Table

## LSTC BUILDING SCHEDULES

## Schedules:

AVAIL AVAILABLE (100%)  
CLGONLY COOLING ONLY (DESIGN)  
DAYSCHED COOLING FAN SCHEDULE CODE  
OFF ALWAYS OFF  
OFFICEL1 TYPICAL OFFICE SCHEDULE FOR LIGHTING  
OFFICEL2 TYPICAL OFFICE SCHEDULE 1 LIGHTING-25%  
OFFICEL6 TYPICAL OFFICE SCHEDULE 5 LIGHTING-50%  
OFFICEL7 TYPICAL OFFICE SCHEDULE 1-OCC. SEN ECO  
OFFICEL8 TYPICAL OFFICE SCHEDULE 2-OCC. SEN ECO  
OFFICEL9 TYPICAL OFFICE SCHEDULE 3-OCC. SEN ECO  
OFFICEM1 TYPICAL UPS MISCELLANEOUS EQ. SCHEDULE  
OFFICEP1 TYPICAL OFFICE SCHEDULE FOR PEOPLE  
OFFICEL10 TYPICAL OFFICE SCHEDULE 4-OCC. SEN ECO  
OFFICEL11 TYPICAL OFFICE SCHEDULE 5-OCC. SEN ECO  
OFFICEL12 TYPICAL OFFICE SCHEDULE 6-OCC. SEN ECO  
OFFICEL13 TYPICAL OFFICE SCHEDULE 6-OCC. SEN ECO  
OFFICEL14 TYPICAL OFFICE SCHEDULE 7-OCC. SEN ECO  
OFFICEL15 TYPICAL OFFICE SCHEDULE 8-OCC. SEN ECO  
OFFICEL16 TYPICAL OFFICE SCHEDULE 9-OCC. SEN ECO  
OFFICEL17 TYPICAL OFFICE SCHEDULE 10OCC. SEN ECO  
OFFICEL18 TYPICAL OFFICE SCHEDULE 11OCC. SEN ECO  
OFFICEL19 TYPICAL OFFICE SCHEDULE 12OCC. SEN ECO  
OFFICEL20 TYPICAL OFFICE SCHEDULE 13OCC. SEN ECO  
OFFICEL21 TYPICAL OFFICE SCHEDULE 14OCC. SEN ECO  
OFFICEL22 TYPICAL OFFICE SCHEDULE 15OCC. SEN ECO  
OFFICEL23 TYPICAL OFFICE SCHEDULE 16OCC. SEN ECO  
OFFICEL25 TYPICAL OFFICE SCHEDULE LIGHTING-80%  
OFFICEL26 TYPICAL OFFICE SCHEDULE 1 LIGHTING-94%  
OFFICEL27 TYPICAL OFFICE SCHEDULE LIGHTING-58%  
OFFICEL28 TYPICAL OFFICE SCHEDULE LIGHTING-95%  
OFFICEL29 TYPICAL OFFICE SCHEDULE LIGHTING-28%  
OPSTART OPTIMUM START COOLING FAN SCHED. CODE  
OPSTOP OPTIMUM STOP COOLING FAN SCHED. CODE

## System:

BPMZ BYPASS MULTIZONE  
COMP COMPUTER ROOM UNIT  
TRH TERMINAL REHEAT

## Equipment:

## Cooling:

EQ1010S 2-STG CTV<190 TONS W\HT REC(95 DEG HW)

## Heating:

EQ2002 GAS FIRED STEAM BOILER  
EQ2263 ELECTRIC RESISTANCE HEAT WITH FAN

## Fan:

EQ4003 FC CENTRIFUGAL - CONSTANT VOLUME  
EQ4223 FC FAN W\ARIABLE SPEED DRIVE

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5020 HEATING WATER CIRCULATION PUMP

Sc' le Name: AVAIL  
Pro,ect: AVAILABLE (100)  
Location:  
Client: VERSION 3.0  
Program User: C.D.S. MARKETING  
Comments: BUILDING TEMPLATE SERIES

Starting Month: JAN Ending Month: HTG  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Sc' le Name: CLGONLY  
Project: COOLING ONLY (DESIGN)  
Location:  
Client:  
Program User:  
Comments: COOLING ONLY SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Starting Month: HTG Ending Month: HTG  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Sc' e Name: DAYSCHED  
Project: COOLING FAN SCHEDULE CODE  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: FAN CODE IN MODELING OPTIMUM S

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
6	100
17	0
24	

Sc' le Name: OFF  
Project: ALWAYS OFF  
Location:  
Client:  
Program User:  
Comments:

Starting Month: JAN Ending Month: HTG  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Schedule Name: OFFICEL1

Project: TYPICAL OFFICE SCHEDULE FOR LIG

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0		100
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

Hour	Util	Percent
0		0
7		100
16		0
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0		0
24		



Schedule Name: OFFICEL2

Project: TYPICAL OFFICE SCHEDULE 1 LIGHT

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	25
7	100
16	25
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	25
24	

Scenario Name: OFFICEL6  
Project: TYPICAL OFFICE SCHEDULE 5 LIGHT  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 50  
7 100  
16 50  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 50  
24

Sc...le Name: OFFICEL7  
Pro...t: TYPICAL OFFICE SCHEDULE 1-OCC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0		81
7		100
12		81
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0		81
24		

Scenario Name: OFFICEL8  
Project: TYPICAL OFFICE SCHEDULE 2-OCC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0		0
7		100
8		6
12		0
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0		0
24		

Sc h e Name: OFFICEL9  
Project: TYPICAL OFFICE SCHEDULE 3-OCC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 33  
7 42  
9 100  
10 33  
11 33  
12 36  
13 33  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 33  
24

Sc' le Name: OFFICEM1  
Project: TYPICAL UPS MISCELLANEOUS EQ. S  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: MISC. LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0	50	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Ho.	Jtil	Percent
0	50	
24		

Sc' 'e Name: OFFICEP1  
Product: TYPICAL OFFICE SCHEDULE FOR PEO  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
7 100  
12 10  
13 100  
16 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Sc h e Name: OFICEL10  
Project: TYPICAL OFFICE SCHEDULE 4-OCC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0		0
13		100
14		0
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0		0
24		



Scenario Name: OFICEL11  
Project: TYPICAL OFFICE SCHEDULE 5-OCC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util Percent
0	85
7	100
8	85
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	85
24	

Sc' e Name: OFICEL12  
Pro,ut: TYPICAL OFFICE SCHEDULE 6-OCC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0		5
7		80
10		93
11		5
13		100
1'		5

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0		5
24		

Schedule Name: OFICEL13

Project: TYPICAL OFFICE SCHEDULE 6-OCC.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	0
7	10
8	100
9	0
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
24	

Sc' 'e Name: OFICEL14  
 Project: TYPICAL OFFICE SCHEDULE 7-OCC.  
 Location:  
 Client:  
 Program User: HUITT ZOLLARS, INC.  
 Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
 0 100  
 24

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
 0 0  
 7 86  
 9 0  
 13 100  
 14 86  
 1' 0

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
 0 0  
 24

Schedule Name: OFICEL15

Project: TYPICAL OFFICE SCHEDULE 8-OCC.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	25
10	100
11	25
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	25
24	

Sc File Name: OFICEL16  
Project: TYPICAL OFFICE SCHEDULE 9-OCC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	88
13	100
14	88
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	88
24	

Scene Name: OFICEL17  
Project: TYPICAL OFFICE SCHEDULE 100CC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util Percent
0	40
7	94
9	86
11	40
12	100
17	40

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	40
24	

Scenario Name: OFICEL18  
Project: TYPICAL OFFICE SCHEDULE 110CC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
7 93  
8 50  
10 0  
13 100  
17 50  
0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24



Sc' le Name: OFICEL19  
Project: TYPICAL OFFICE SCHEDULE 120CC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 47  
7 92  
11 100  
12 47  
13 92  
14 47

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 6  
24

Sc' le Name: OFICEL20  
Project: TYPICAL OFFICE SCHEDULE 130CC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 77  
7 88  
9 100  
10 88  
11 93  
12 77

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 77  
24

Sc: le Name: OFICEL21  
Project: TYPICAL OFFICE SCHEDULE 140CC.  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 0  
11 96  
12 75  
15 100  
16 0  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Sc: le Name: OFICEL22  
 Project: TYPICAL OFFICE SCHEDULE 150CC.  
 Location:  
 Client:  
 Program User: HUITT ZOLLARS, INC.  
 Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0	100
24	

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0	23
7	96
9	23
13	100
16	23
24	

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0	23
24	

Schedule Name: OFICEL23

Project: TYPICAL OFFICE SCHEDULE 160CC.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

Hour	Util Percent
0	4
8	100
12	4
13	100
16	4
24	

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	4
24	

Sc: le Name: OFICEL25  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util Percent
0	80
7	100
16	80
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	80
24	

Sc' le Name: OFICEL26  
Project: TYPICAL OFFICE SCHEDULE 1 LIGHT  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 94  
7 100  
16 94  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 94  
24

Sc' le Name: OFICEL27  
 Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
 Location:  
 Client:  
 Program User: HUITT ZOLLARS, INC.  
 Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0	58	
7	100	
16	58	
24		

Starting Month: JAN Ending Month: DEC  
 Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0	58	
24		



Sc' le Name: OFICEL28  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 95  
7 100  
16 95  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 95  
24

Sc le Name: OFICEL29  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----

0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----

0 28  
7 100  
16 28  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----

0 28  
24

Scenario Name: OPSTART  
Project: OPTIMUM START COOLING FAN SCHED  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0  
Whenever any of the following conditions are true.

Sensor				Optional	Offset
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
6	100
7	0
2'	

Schedule Name: OPSTOP

Project: OPTIMUM STOP COOLING FAN SCHED.

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: DETERMINE AMOUNT OF TIME TO CY

Reset utilization percent to : 0

whenever any of the following conditions are true.

Sensor			Optional Offset		
Type	Op	Value	Type/Units	Value	Units
RMDB	>	0	CSTAT	5	DEG-F
RMDB	<	0	HSTAT	-5	DEG-F
RMRH	>	0	DSRMRH	10	PERCENT

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	0
16	100
17	0
2	

## Utility Description Reference Table

## Schedules:

AVAIL AVAILABLE (100%)  
CLGONLY COOLING ONLY (DESIGN)  
DAYSCHED COOLING FAN SCHEDULE CODE  
OFF ALWAYS OFF  
OFFICEL1 TYPICAL OFFICE SCHEDULE FOR LIGHTING  
OFFICEL2 TYPICAL OFFICE SCHEDULE 1 LIGHTING-25%  
OFFICEL7 TYPICAL OFFICE SCHEDULE 1-OCC. SEN ECO  
OFFICEL8 TYPICAL OFFICE SCHEDULE 2-OCC. SEN ECO  
OFFICEL9 TYPICAL OFFICE SCHEDULE 3-OCC. SEN ECO  
OFFICEM1 TYPICAL UPS MISCELLANEOUS EQ. SCHEDULE  
OFFICEP1 TYPICAL OFFICE SCHEDULE FOR PEOPLE  
OFICEL10 TYPICAL OFFICE SCHEDULE 4-OCC. SEN ECO  
OFICEL11 TYPICAL OFFICE SCHEDULE 5-OCC. SEN ECO  
OFICEL12 TYPICAL OFFICE SCHEDULE 6-OCC. SEN ECO  
OFICEL13 TYPICAL OFFICE SCHEDULE 6-OCC. SEN ECO  
OFICEL14 TYPICAL OFFICE SCHEDULE 7-OCC. SEN ECO  
OFICEL15 TYPICAL OFFICE SCHEDULE 8-OCC. SEN ECO  
OFICEL16 TYPICAL OFFICE SCHEDULE 9-OCC. SEN ECO  
OFICEL17 TYPICAL OFFICE SCHEDULE 10OCC. SEN ECO  
OFICEL18 TYPICAL OFFICE SCHEDULE 11OCC. SEN ECO  
OFICEL19 TYPICAL OFFICE SCHEDULE 12OCC. SEN ECO  
OFICEL20 TYPICAL OFFICE SCHEDULE 13OCC. SEN ECO  
OFICEL21 TYPICAL OFFICE SCHEDULE 14OCC. SEN ECO  
OFICEL22 TYPICAL OFFICE SCHEDULE 15OCC. SEN ECO  
OFICEL23 TYPICAL OFFICE SCHEDULE 16OCC. SEN ECO  
OPSTART OPTIMUM START COOLING FAN SCHED. CODE  
OPSTOP OPTIMUM STOP COOLING FAN SCHED. CODE

## System:

BPMZ BYPASS MULTIZONE  
COMP COMPUTER ROOM UNIT  
VRH VARIABLE VOLUME REHEAT

## Equipment:

## Cooling:

EQ1010S 2-STG CTV<190 TONS W\HT REC(95 DEG HW)  
YCENT123 YORK CENT. R-123 CHILLER  
YWCRECIP YORK W.C. RECIP. CHILL.

## Heating:

EQ2002 GAS FIRED STEAM BOILER  
EQ2263 ELECTRIC RESISTANCE HEAT WITH FAN  
OILBLR OIL FIRED HOT WATER BOILER

## Fan:

EQ4003 FC CENTRIFUGAL - CONSTANT VOLUME  
EQ4223 FC FAN W\ARIABLE SPEED DRIVE

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5020 HEATING WATER CIRCULATION PUMP

CONTENTS OF : C:\CDS\TULTRA\CLG\YWCRECIP.CLG

LINE # -----

1 JOB - 1  
 2 01/YORK W.C. RECIP. CHILL.  
 3 01/RECIPOCATING CHILLER - WATER COOLED  
 4 01/YORK MODEL YCWZ CHILLER  
 5 01/HUITT ZOLLARS, INC.  
 6 01/  
 7 02/YORK WAT. COOLED RECIP MOD. YCWZ CHILLER/RECIP///TONS/.848/KW-TON  
 8 03/EQ5001///EQ5011  
 9 04/////EQ5300  
 10 05/0/NO/NO/NONE//85/65////44//ELEC  
 11 06/7/15/PERCENT/100/82/67/48/46/30/15  
 12 07/PERCENT/100/80.4/66.9/47.0/40.7/26.2/14.3  
 13 08/H2OCOOL/PCTHTSNK/0/0  
 14 09/8/17  
 15 10/YES  
 16 12/NONE

LINE # -----

1	JOB - 1
2	01/YORK CENT. R-123 CHILLER
3	01/CENTRIFUGAL CHILLER
4	01/1 - STAGE 330 TON YORK MODEL YT
5	01/HUITT-ZOLLARS, INC.
6	01/NEW R-123 CHILLER
7	02/1-STAGE 330 TON YORK MODEL YK/CENTRIF///TONS/.59/KW-TON
8	03/EQ5001///EQ5011
9	04////EQ5300
10	05/0/NO/NO/NONE//85/65///44//ELEC
11	06/10/10/PERCENT/100/90/80/70/60/50/40/30/20/10
12	07/PERCENT/100/90/80/72/64/56/49/41/33/24
13	08/H2OCOOL/PCTHTSNK/10.8/21.1
14	09/10/20
15	10/YES
16	12/NONE

CONTENTS OF : C:\CDS\TULTRA\HTG\OILBLR.HTG

LINE #

-----  
1 JOB - 1  
2 01/OIL FIRED HOT WATER BOILER  
3 01/OIL FIRED HOT WATER BOILER  
4 01/EXISTING BOILERS  
5 01/HUITT-ZOLLARS, INC.  
6 01/  
7 02/HOT H2O BOILER, OIL/OIL//EQ5020////MBH/83.3/PCTEFF  
8 03////EQ5307  
9 04/2/0/CURVE/0/1.0



## Utility Description Reference Table

## TC-1 &amp; TC-2 BUILDINGS SCHEDULES

## Schedules:

AVAIL AVAILABLE (100%)  
CLGONLY COOLING ONLY (DESIGN)  
ESH53 HELSTF ENERGY STUDY WHITE SANDS  
OFF ALWAYS OFF  
OFFCEM1 TYPICAL UPS MISCELLANEOUS EQ. SCHEDULE  
OFFCEP1 TYPICAL OFFICE SCHEDULE FOR PEOPLE  
OFICEL24 TYPICAL OFFICE SCHD LIGHTING 58%  
OFICEL30 TYPICAL OFFICE SCHEDULE LIGHTING-92%  
OFICEL31 TYPICAL OFFICE SCHEDULE LIGHTING-98%  
OFICEL32 TYPICAL OFFICE SCHEDULE LIGHTING-83%  
OFICEL33 TYPICAL OFFICE SCHEDULE LIGHTING-80%  
OFICEL34 TYPICAL OFFICE SCHEDULE LIGHTING-59%  
OFICEL35 TYPICAL OFFICE SCHEDULE LIGHTING-3 HR

## System:

TRH TERMINAL REHEAT  
VTCV VARIABLE TEMP CONSTANT VOL

## Equipment:

## Cooling:

EQ1001S 2-STG CENTRIFUGAL CHILLER <550 TONS

## Heating:

BLR51 OIL FIRED HOT WATER BOILER

## Fan:

EQ4003 FC CENTRIFUGAL - CONSTANT VOLUME

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5013 WATER CIRCULATING PUMP - CONSTANT VOLUME  
EQ5020 HEATING WATER CIRCULATION PUMP

Schedule Name: AVAIL

Project: AVAILABLE (100)

Location:

Client: VERSION 3.0

Program User: C.D.S. MARKETING

Comments: BUILDING TEMPLATE SERIES

Starting Month: JAN Ending Month: HTG

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 100

24

Schedule Name: CLGONLY  
Project: COOLING ONLY (DESIGN)  
Location:  
Client:  
Program User:  
Comments: COOLING ONLY SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 100  
24

Starting Month: HTG Ending Month: HTG  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----  
0 0  
24

Sc' .e Name: ESH53

Project: HELSTF ENERGY STUDY WHITE SANDS

Location: ALAMOGORDO, N.M.

Client: CORP OF ENGINEERS - FORT WORTH,

Program User: HUITT ZOLLARS, INC.

Comments: ELECTRIC HUMIDIFIER SCHEDULE

Starting Month: JAN Ending Month: MAR

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	100
17	0
24	

Starting Month: APR Ending Month: APR

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	100
21	0
24	

Starting Month: MAY Ending Month: MAY

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	100
16	0
24	

Starting Month: JUN Ending Month: JUN

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	100
11	0
24	

Starting Month: JUL Ending Month: JUL

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Hour	Util Percent
0	100
7	0
24	

Starting Month: AUG Ending Month: SEP

Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

Schedule Name: OFF  
Project: ALWAYS OFF  
Location:  
Client:  
Program User:  
Comments:

Starting Month: JAN Ending Month: HTG  
Starting Day Type: DSGN Ending Day Type: SUN

Hour Util Percent

-----

0 0

24

Schedule Name: OFFICEM1  
Project: TYPICAL UPS MISCELLANEOUS EQ. S  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: MISC. LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util Percent
0	100
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util Percent
0	50
24	

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util Percent
0	50
24	

Schedule Name: OFFICEP1  
Project: TYPICAL OFFICE SCHEDULE FOR PEO  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: PEOPLE LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0		100
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0		0
7		100
12		10
13		100
16		0
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0		0
24		

Scene Name: OFICEL24

Project: TYPICAL OFFICE SCHD LIGHTING 58

Location:

Client:

Program User: HUITT ZOLLARS, INC.

Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC

Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

Hour	Util	Percent
0	65	
7	100	
16	65	
24		

Starting Month: JAN Ending Month: DEC

Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

Hour	Util	Percent
0	65	
24		



Schedule Name: OFICEL30  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour Util Percent

-----  
0 100  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour Util Percent

-----  
0 92  
7 100  
9 92  
24

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour Util Percent

-----  
0 92  
24

Schedule Name: OFICEL31  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
-----		
0	100	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
-----		
0	98	
10	100	
11	98	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
-----		
0	98	
24		

Schedule Name: OFICEL32  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0	83	
9	100	
11	83	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0	83	
24		

Schedule Name: OFICEL33  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0	80	
9	100	
11	80	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0	80	
24		

Schedule Name: OFICEL34  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0	18	
7	100	
8	59	
19	18	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0	18	
24		

Schedule Name: OFICEL35  
Project: TYPICAL OFFICE SCHEDULE LIGHTIN  
Location:  
Client:  
Program User: HUITT ZOLLARS, INC.  
Comments: LIGHTING LOAD SCHEDULE

Starting Month: JAN Ending Month: DEC  
Starting Day Type: DSGN Ending Day Type: DSGN

Hour	Util	Percent
0	100	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: WKDY Ending Day Type: WKDY

Hour	Util	Percent
0	0	
7	100	
10	0	
24		

Starting Month: JAN Ending Month: DEC  
Starting Day Type: SAT Ending Day Type: SUN

Hour	Util	Percent
0	0	
24		

Utility Description Reference Table  
-----

## Schedules:

AVAIL AVAILABLE (100%)  
CLGONLY COOLING ONLY (DESIGN)  
OFF ALWAYS OFF  
OFFICEM1 TYPICAL UPS MISCELLANEOUS EQ. SCHEDULE  
OFFICEP1 TYPICAL OFFICE SCHEDULE FOR PEOPLE  
OFICEL30 TYPICAL OFFICE SCHEDULE LIGHTING-92%  
OFICEL31 TYPICAL OFFICE SCHEDULE LIGHTING-98%  
OFICEL32 TYPICAL OFFICE SCHEDULE LIGHTING-83%  
OFICEL33 TYPICAL OFFICE SCHEDULE LIGHTING-80%  
OFICEL34 TYPICAL OFFICE SCHEDULE LIGHTING-59%  
OFICEL35 TYPICAL OFFICE SCHEDULE LIGHTING-3 HR

## System:

TRH TERMINAL REHEAT  
VTCV VARIABLE TEMP CONSTANT VOL

## Equipment:

## Cooling:

EQ1001S 2-STG CENTRIFUGAL CHILLER <550 TONS  
YCENT123 YORK CENT. R-123 CHILLER

## Heating:

BLR51 OIL FIRED HOT WATER BOILER  
OILBLR OIL FIRED HOT WATER BOILER

## Fan:

EQ4003 FC CENTRIFUGAL - CONSTANT VOLUME

## Tower:

EQ5100 COOLING TOWER FANS

## Misc:

EQ5013 WATER CIRCULATING PUMP - CONSTANT VOLUME  
EQ5020 HEATING WATER CIRCULATION PUMP

CONTENTS OF : C:\CDS\TULTRA\CLG\YCENT123.CLG

LINE # -----

1	JOB - 1
2	01/YORK CENT. R-123 CHILLER
3	01/CENTRIFUGAL CHILLER
4	01/1 - STAGE 330 TON YORK MODEL YT
5	01/HUITT-ZOLLARS, INC.
6	01/NEW R-123 CHILLER
7	02/1-STAGE 330 TON YORK MODEL YK/CENTRIF///TONS/.59/KW-TON
8	03/EQ5001///EQ5011
9	04/////EQ5300
10	05/0/NO/NO/NONE//85/65///44//ELEC
11	06/10/10/PERCENT/100/90/80/70/60/50/40/30/20/10
12	07/PERCENT/100/90/80/72/64/56/49/41/33/24
13	08/H2OCOOL/PCTHTSNK/10.8/21.1
14	09/10/20
15	10/YES
16	12/NONE



CONTENTS OF : C:\CDS\TULTRA\HTG\BLR51.HTG

LINE # -----  
1 JOB - 1  
2 01/OIL FIRED HOT WATER BOILER  
3 01/OIL FIRED HOT WATER BOILER  
4 01/EXISTING BOILERS  
5 01/HUITT-ZOLLARS, INC.  
6 01/  
7 02/HOT H2O BOILER, OIL/OIL//EQ5020///MBH/83.3/PCTEFF  
8 03////EQ5307  
9 04/2/0/CURVE/0/1.0

CONTENTS OF : C:\CDS\TULTRA\HTG\OILBLR.HTG

LINE # -----  
1 JOB - 1  
2 01/OIL FIRED HOT WATER BOILER  
3 01/OIL FIRED HOT WATER BOILER  
4 01/EXISTING BOILERS  
5 01/HUITT-ZOLLARS, INC.  
6 01/  
7 02/HOT H2O BOILER, OIL/OIL/EQ5020////MBH/83.3/PCTEFF  
8 03/////EQ5307  
9 04/2/0/CURVE/0/1.0